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Supreme Court, U. S.

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IN THE  
**Supreme Court of the United States**

OCTOBER TERM, 1977

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No. 77-  
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HUGHES AIRCRAFT COMPANY,  
*Petitioner,*

v.

BELL TELEPHONE LABORATORIES, INCORPORATED,  
*Respondent.*

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**PETITION FOR A WRIT OF CERTIORARI TO THE  
UNITED STATES COURT OF APPEALS FOR THE  
THIRD CIRCUIT**  
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**PETITION FOR A WRIT OF CERTIORARI TO THE  
UNITED STATES COURT OF APPEALS FOR THE  
THIRD CIRCUIT**

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Hughes Aircraft Company respectfully petitions for a writ of certiorari to review the judgment of the United States Court of Appeals for the Third Circuit in the above-entitled case.

**OPINIONS BELOW**

The opinion of the Court of Appeals (App. 25a-30a) is reported at 564 F.2d 654 (3d Cir. 1977). The opinion of the District Court (App. 1a-24a) is reported at 422 F. Supp. 372 (D. Del. 1976).

**JURISDICTION**

The judgment of the Court of Appeals was entered on October 25, 1977. The jurisdiction of this Court is invoked under 28 U.S.C. § 1254(1).

### QUESTIONS PRESENTED

1. Whether the court below erred in holding, contrary to the rule in other Circuit Courts and in the Court of Customs and Patent Appeals, that experimentation which is directed solely to enhancing the commercial desirability and utility of a particular invention, but which is not necessary for the invention's successful reduction to practice, nevertheless constitutes "reasonable diligence" in reducing that invention to practice, as required by 35 U.S.C. § 102(g).

2. Whether the court below erred in holding, contrary to the rule in other Circuit Courts and in violation of important principles of public policy, that inventors may meet their burden of proving "reasonable diligence" through their own uncorroborated, undocumented oral testimony and other noncontemporaneous evidence, particularly in cases where they were aware of the need for full contemporaneous documentation, where they created no such documentation, and where they even destroyed some of the requisite documents.

### STATUTES INVOLVED

#### 35 U.S.C. § 291. Interfering Patents

The owner of an interfering patent may have relief against the owner of another by civil action, and the court may adjudge the question of the validity of any of the interfering patents, in whole or in part. \* \* \*

#### 35 U.S.C. § 102(g). Conditions for Patentability; Novelty and Loss of Right to Patent

A person shall be entitled to a patent unless—

\* \* \*

(g) before the applicant's invention thereof the invention was made in this country by another who had not abandoned, suppressed, or concealed it. In determining priority of invention there shall be considered not only the respective dates of conception and reduction to practice of the invention, but also the reasonable diligence of one who is first to conceive and last to reduce to practice, from a time prior to conception by the other.

### STATEMENT

In May of 1966, Hans Dill, an employee of Hughes Aircraft Company ("Hughes"), invented a novel and useful method of making very small transistors from semiconductor material. Much effort was expended at Hughes over the next five months to establish the feasibility of Dill's invention, and a patent on it was applied for by Hughes on October 26, 1966.

Dill's invention was the process of making a "silicon-gate field effect transistor" ("SGFET"), a type of electronic amplifier for integrated circuitry. Because such devices are so small (several thousand per square inch), they are especially valuable for use in computers and sophisticated calculators. The United States Patent and Trademark Office subsequently issued Hughes a patent on this invention.

On March 27, 1967—over one year after it had conceived the invention and five months after Hughes filed its patent application—Bell Telephone Laboratories, Inc. ("Bell"), applied for a patent on a process substantially identical to the Hughes invention, and the Patent Office also issued a patent to Bell.<sup>1</sup>

<sup>1</sup> In the proceedings below, the Bell patent was referred to as the "Kerwin patent," after the first named inventor in the patent application. In like manner, the name of the Hughes inventor, Dill, was used to identify the Hughes patent.

Nearly four years after it had learned of the existence of the Hughes patent (J.A. 11),<sup>2</sup> Bell brought this action against Hughes in the United States District Court for the District of Delaware, alleging that the Hughes patent interfered with Bell's patent, and that Bell should be declared the prior inventor, pursuant to 35 U.S.C. § 291.<sup>3</sup>

At trial, the existence of an interference was not disputed, and so priority of invention was the major legal question. Under 35 U.S.C. § 102(g), the law presumes that the first inventor to reduce the invention to practice (in this case, Hughes) has priority, *unless* the rival inventor can prove that he was first to conceive the invention *and* that in preparing his patent application or otherwise reducing his invention to practice, he exercised "reasonable diligence" from prior to the time the other inventor conceived the same idea.

The parties stipulated (J.A. 12) that Hughes employee Dill conceived the disputed invention on May 1, 1966, and reduced it to practice by filing a patent application on October 26, 1966. After noting the stipulation (App. 4a), the District Court found that Bell employees conceived the invention in February or March 1966—prior to Hughes—but had not reduced it to practice until well after Hughes—sometime in December 1966 or January 1967. App. 17a. Thus, under 35 U.S.C. § 102(g), the issue before the lower courts was whether Bell could meet its burden of proving that it exercised "reasonable diligence" in reducing its conception to prac-

<sup>2</sup> Record citations throughout this Petition will be to the Joint Appendix ("J.A.") filed by the parties in the Third Circuit. "App.," on the other hand, refers to the Appendix to this Petition.

<sup>3</sup> Bell made the same claim in the District Court against the General Instrument Corporation ("GI"), alleging that GI's patent also interfered with the Bell patent. In a separate lawsuit, however, Hughes had successfully established its seniority over GI, and hence GI withdrew from this litigation, allowing a default judgment to be entered against it.

tice during the entire period between May 1, 1966, the date Hughes conceived this invention, and approximately January of 1967, the time Bell reduced the invention to practice.

At trial Bell's employees testified that they were absorbed through June in trying to make a workable device. They then postponed completion of testable devices in favor of experimentation directed at collateral goals. One of the inventors conceded that they could have completed the devices at any time after June, using conventional techniques (J.A. 108-109), and the court so found. App. 10a. Instead, the inventor testified that Bell's goal from July forward was "to make the transistor more optimum." J.A. 161. One desired improvement was the elimination of hysteresis, a form of electrical instability which, as the trial court found, would not prevent the invention from being reduced to practice, but which would make it somewhat less desirable commercially. App. 11a. During the early fall, the only one of Bell's inventors who was then working on the silicon-gate project concentrated exclusively on that hysteresis problem. App. 10a; J.A. 495-501.

Hughes contended that since the work on hysteresis was directed to commercial enhancement, rather than reduction to practice, such work could not, as a matter of law, be deemed "reasonable diligence" under 35 U.S.C. § 102(g). The District Court, however, rejected that contention and held, contrary to the legal rule in the cases cited by Hughes, that Bell's "work on problems inhibiting commercial utilization of the process should be deemed reasonable diligence \* \* \*." App. 19a n.19.

In trying to show its reasonable diligence for the rest of the fall and early winter of 1966, Bell relied almost exclusively on the oral testimony of the inventors, in view of a lack of documentation covering the period at issue. One especially noteworthy gap in the documenta-



tion concerns the laboratory notebook of Mr. Sarace (Plaintiff's Exhibit 16), covering a period when he was the only Bell employee working on the project full-time. His entries occurred almost daily and were quite detailed for the months of September and part of October, but they stopped abruptly and without explanation on October 17, 1966. The entries commenced again with a note for January 17, 1967. To reconstruct the events of the period between October 17 and some time in December, when the trial court held that reduction to practice may have occurred, Bell relied upon the almost ten-year-old recollections of the Bell inventors themselves, and of their co-workers, without the benefit of any written chronicle of Bell's activities.

The trial court required no further proof of effort, and held on the basis of that evidence that Bell had met its burden to prove reasonable diligence, even in the absence of contemporaneous documentation on the point. Judgment was entered in favor of Bell.

The Court of Appeals held that the trial court had used the proper legal standards in considering these issues, that the findings of fact were not "clearly erroneous," and that the judgment should be affirmed. App. 28a-30a.

## REASONS FOR GRANTING THE WRIT

### Introduction

One of the fundamental principles of our patent system is that whenever there are two separate, independent inventors of a single invention, the law will presume that the first to file a patent application was the prior inventor. That presumption is designed to reward the one who promptly discloses for the benefit of the public the new thing that has been invented. The inventor who files

second generally receives no such reward because he has brought no additional benefit to the public. However, the second to file may nevertheless be accorded priority if he can prove that (a) he was first to conceive the invention, and (b) even though he was second to file his application or otherwise reduce the invention to practice, he did exercise "reasonable diligence" in accomplishing such reduction to practice. 35 U.S.C. § 102(g).

Until the decision of the Third Circuit in this case, the law had been well-settled—and all inventors had plainly been on notice—regarding two critical aspects of the "reasonable diligence" standard. The first was that the requisite diligence related solely to those activities specifically directed toward reducing the invention to practice; in other words, delay in filing for a patent could not be justified by time and efforts expended either in enhancing the commercial utility of the invention or in improving auxiliary features not directly related to the goal of reducing the invention to practice. And the other established tenet in the law of diligence was that an inventor claiming priority by virtue of an asserted earlier conception and reasonably diligent reduction to practice bore a heavy burden of proof in establishing such a claim—a burden that could not be sustained by self-serving testimony or noncontemporaneous documents of the inventor himself, without independent corroboration.

As discussed more fully hereinafter, the decision of the courts below is contrary to both those settled principles. It creates serious uncertainty and instability as to matters of far-reaching importance, affecting both the conduct of potential inventors and the hoped-for benefits to the public, and it conflicts with the hitherto unquestioned decisions of other Circuits and the Court of Customs and Patent Appeals. Such a conflict is particularly troublesome in the field of patent law, where the



parties involved are frequently amenable to suit in many different jurisdictions, and the risk is therefore great that the considerable public and private interests involved will be settled by means of forum-shopping. Thus, the decision below warrants review by this Court. See *Kewanee Oil Co. v. Bicron Corp.*, 416 U.S. 470, 472 (1973); *Brenner v. Manson*, 383 U.S. 519, 522 & n.4 (1966).

Furthermore, a second threat is posed by the lower courts' opinions in this case—one which standing alone is of sufficient public concern to merit this Court's attention. The courts below have approved the use of interested parties' uncorroborated oral recollections as a basis for resolving a multi-million dollar patent dispute. They have so ruled in a case in which the prevailing party is a sophisticated, patent-wise corporation that failed to record some vital parts of the contemporaneous invention history and destroyed the records originally made respecting other parts. This unprecedented decision threatens to foster litigation, and to invite perjury and destruction of evidence, in an area of law where the public interest is so great that no such risk should be tolerated.

**1. The Circuit Court's holding that reasonable diligence may consist of work unrelated to reduction to practice conflicts with the rule in other Circuits and with fundamental principles of patent law.**

The Third Circuit and the District Court have held in this case that inventors' work on problems related solely to commercial utilization, and not to reduction to practice, can be deemed "reasonable diligence" in reducing an invention to practice within the meaning of 35 U.S.C. § 102(g). That holding is in direct conflict with the well-established position of the United States Court of

Customs and Patent Appeals, as well as with the position of every other Circuit Court that has considered this issue.<sup>4</sup>

It has long been the law that "a discoverer or inventor, in order to get a patent for a process, [need not] have succeeded in bringing his art to the highest degree of perfection." *The Telephone Cases*, 126 U.S. 1, 536 (1888). Indeed, so long as the invention "performs, though only in a crude way, the important function by which it makes the substantial change claimed for it in the art, it is enough." *Hildreth v. Mastoras*, 257 U.S. 27, 34 (1921). As a consequence of this basic principle, it has been universally recognized that developing the commercialization or marketability of an invention is neither a part of its reduction to practice nor a prerequisite to its patentability.<sup>5</sup>

Any other rule would have been at war with the underlying purposes of our patent system, which is con-

<sup>4</sup> The Third Circuit itself previously agreed with the position urged by Petitioner here. Judges Biggs, Goodrich, Kalodner, Magruder and Maris so held in two previous cases. *S&S Corrugated Paper Mach. Co. v. George W. Swift, Jr., Inc.*, 176 F.2d 358 (3d Cir. 1949); *Riche v. Permutit Co.*, 135 F.2d 922 (3d Cir. 1943), *aff'd* 47 F. Supp. 275 (D. Del. 1942). The instant case necessarily overrules these 30-year-old rulings.

<sup>5</sup> *E.g.*, *Cody v. Aktiebolaget Flymo*, 452 F.2d 1274, 1283 (D.C. Cir. 1971), *cert. denied*, 405 U.S. 990 (1972); *Kardulas v. Florida Machine Products Co.*, 438 F.2d 1118, 1121 (5th Cir. 1971); *Sutter Products Co. v. Pettibone Mulliken Corp.*, 428 F.2d 639, 647 (7th Cir. 1970); *Farrand Optical Co. v. United States*, 325 F.2d 328, 332-333 (2d Cir. 1963); *Douglas v. United States*, 510 F.2d 364, 366 (Ct. Cl.), *cert. denied*, 423 U.S. 825 (1975); *Mattor v. Coolegem*, 530 F.2d 1391, 1395 (C.C.P.A. 1976); *Cochran v. Kresock*, 530 F.2d 385, 391 (C.C.P.A. 1976); *Application of Anthony*, 414 F.2d 1383, 1396 (C.C.P.A. 1969); *Fleming v. Bosch*, 181 U.S.P.Q. 761 (Bd. Pat. Intf. 1973); *Gunn v. Bosch*, 181 U.S.P.Q. 758 (Bd. Pat. Intf. 1973).

The Board of Patent Interferences is the important administrative tribunal that has day-to-day responsibility for carrying out the dictates of the statute. 35 U.S.C. § 135.

stitutionally required to "promote the Progress of Science and useful Arts \* \* \*." U.S. Const. Art. I, § 8, cl. 8. It does so by securing to an inventor the exclusive right to exploit his advancement of human knowledge for a limited time. Such a grant is not designed to secure to the inventor any natural property right in his discoveries, but rather to induce him to disclose fully his new knowledge for the public benefit. *Graham v. John Deere Co.*, 383 U.S. 1, 9 (1966). It is through that full disclosure that the system "stimulates ideas and the eventual development of further significant advances in the art." *Kewanee Oil Co. v. Bicron Corp.*, *supra*, 416 U.S. at 481.

Thus, achievement of the constitutionally-envisioned "Progress of Science and useful Arts" depends on prompt reduction to practice and disclosure to the public of that which is new and useful. The constitutional goal of "Progress" would not be attained if inventors could with impunity withhold their discoveries from the eyes of others while these discoveries are being refined and perfected for commercial exploitation before reduction to practice.

That is why the law denies priority to any inventor who was not the first to reduce the disputed invention to practice unless (a) he can *prove* that he was the first to conceive the invention, and (b) he can *also* prove that he was "reasonably diligent" in reducing the invention to practice. 35 U.S.C. § 102(g). And until the present case, the courts unanimously have measured the second inventor's diligence *only* by the work he did that was actually directed to reducing the invention to practice. Thus, except for the decision of the Third Circuit in this case, the rule in every other tribunal which has considered the matter is that work which advances an invention-project overall, but which is not directed to reducing to practice

the specific invention for which the patent is claimed, necessarily cannot be considered "reasonable diligence."<sup>6</sup>

The rulings below are in square conflict with these cases.<sup>7</sup>

<sup>6</sup> *E.g.*, *Abbott v. Shepherd*, 135 F.2d 769, 779 (D.C. Cir. 1942); *Eclipse Mach. Co. v. E. Krieger & Son, Inc.*, 78 F.2d 755 (2d Cir. 1937); *Litchfield v. Eigen*, 535 F.2d 72, 76 (C.C.P.A. 1976); *Fitzgerald v. Arbib*, 268 F.2d 763, 766 (C.C.P.A. 1959); *Smith v. Hayward*, 176 F.2d 914 (C.C.P.A. 1949); *Burns v. Curtis*, 172 F.2d 588, 591 (C.C.P.A. 1949); *Thompson v. Dunn*, 166 F.2d 443, 446-447 (C.C.P.A. 1948); *Fleming v. Bosch*, *supra*; *Gunn v. Bosch*, *supra*.

<sup>7</sup> The following language is typical of the proposition in the cases cited above that it is not enough for the first conceiving party to have spent its time clearing up technical or troublesome details that did not go to the basic premise of the invention, or to have worked on the potential commercial utilization of the invention:

They admit that [during the period at issue], they did not test glutaraldehyde in vivo; in other words, during that period, none of their activity was directed toward reducing their invention to practice. It is of no avail to them that their activities were continuously "directed to the project" of testing numerous compounds for anti-caries activity \* \* \*. [*Litchfield v. Eigen*, *supra*, 535 F.2d at 76.]

\* \* \*

[W]hatever had been done by [Smith] towards promoting the commercial exploitation of the device during that period does not constitute a matter to be considered on the issue of appellant's diligence \* \* \*. [*Smith v. Hayward*, *supra*, 176 F.2d at 922.]

\* \* \*

[P]reparation of samples of specimens which exhibit the Gunn effect, experiments relating to the characteristics exhibited by the samples, and construction of equipment used in the experiments on the samples \* \* \* does not indicate reasonable diligence \* \* \*. [*Gunn v. Bosch*, *supra*, 181 U.S.P.Q. at 761.]

\* \* \*

Similarly, these tribunals have used quite specific and uniformly adamant language to the effect that the first conceiving party, in order to meet the "reasonable diligence" test under the statute, had to have been working toward a reduction to practice of the invention at hand (or toward filing an application for the patent):

Diligence consists in reasonable effort directed toward embodiment of an invention in physical form or toward filing



The decisions in two of the cases cited above, *Abbott v. Shepherd* and *Thompson v. Dunn*, both *supra* note 6, illustrate the direct conflict now existing between the District of Columbia Circuit and the Court of Customs and Patent Appeals, on the one hand, and the Third Circuit on the other.

*Abbott* presented a situation almost identical to the present case. There, two inventors competed for a patent on a process for weaving flexible yarn into cloth. The party with the burden of proving "reasonable diligence" had experimentally demonstrated that his process was workable. However, instead of immediately thereafter performing the practical weaving tests necessary for actual reduction to practice, the inventor spent the next nine months refining a particular facet of the formula which was not part of the invention and was not essential for reduction to practice. The District of Columbia Circuit declared that, as a matter of law, such activity was not reasonable diligence:

However necessary and convincing that activity might have been if the invention claimed had been in the specific formula it finally developed, in relation to the invention in issue it was at most an artisan's sidetrack where the inventor had no business to be when others were coming along the main line. Perfection of utility is to be encouraged. But delay, while one is engaged only in what is already

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an application for the patent. [*Eclipse Mach. Co. v. E. Krieger & Son, Inc.*, *supra*, 87 F.2d at 757.]

\* \* \*

[A]ppellant's activity relative to other devices was of no assistance to him in reducing [his invention] to practice \* \* \*. [*Smith v. Hayward*, *supra*, 176 F.2d at 922.]

\* \* \*

The work relied on must be directed to attaining a reduction to practice of the subject matter of the counts. [*Gunn v. Bosch*, *supra*, 181 U.S.P.Q. at 761.]

known to the art after the essential idea has been proved, is not that diligence which is required to secure priority in invention. [135 F.2d at 779; footnote omitted.]

*Thompson v. Dunn* presents the same situation. There, the priority contest was over a fruit handling machine which, among other things, could be used for more effectively peeling fruit. However, the invention itself contained no peeling mechanism, but only devices for feeding and impaling the fruit. During the period when reasonable diligence was required, the inventor seeking priority had spent time "attempting to develop a *pear peeling mechanism* which, it was thought, would operate more satisfactorily from a commercial standpoint in conjunction with his conception of the invention \* \* \*." 166 F.2d at 446; emphasis in the original. The Court of Customs and Patent Appeals concluded that such efforts relating to "commercial expediency" could not, as a matter of law, constitute diligence:

It is evident from the board's decision that it was of opinion that work done on any part of the completed machine, although not on the elements defined by the involved counts, constituted diligence by appellee in reducing to practice the invention here involved. We are not of that opinion. It is apparent from the record that appellee and his associates contemplated modifications in their peeling mechanism and proceeded to perfect such a mechanism before appellee attempted to reduce to practice the feeding and impaling mechanism called for by the counts in issue. In so doing, appellee, of course, is not open to criticism. It is well settled, however, that diligence will not wait upon commercial expediency. [166 F.2d at 446.]

Though the instant case involves the same issue addressed by the District of Columbia Circuit and the Court of Customs and Patent Appeals, the Third Circuit has

resolved it in precisely the opposite way. The District Court in this case concluded that only one Bell inventor (Sarace) worked on the transistor process during the second half of 1966, and that from some time in late August until some time in late November he was primarily experimenting with an electrical instability (hysteresis) problem.<sup>8</sup> The judge further determined that although hysteresis was a "deficiency which it was desirable to overcome," it "*would not have precluded a successful reduction to practice.*" App. 11a (emphasis added).<sup>9</sup>

Hughes contended before the District Court and again before the Court of Appeals that, on such facts, time spent pursuing a solution to the hysteresis problem could not be credited as reasonable diligence in reducing the invention to practice. The District Court nevertheless held that:

In this Court's view, the silicon gate process, as it existed in the fall of 1966, cannot be readily subjected to rigid compartmentalization. Accordingly, Sarace's work on problems inhibiting commercial utilization of the process should be deemed reasonable diligence, whether that work encompassed the whole of the process, one step in the process, or an ultimately abandoned step. [App. 19a n.19.]

The trial court thus determined that efforts unrelated to reducing the invention to practice can be deemed "reasonable diligence" within the meaning of the patent laws,

<sup>8</sup> As will be subsequently discussed, there is no way of determining what was being done or when and by whom it was being done during much of this period because there were no objective, contemporaneous documents produced on the matter. However, solely for purposes of the present discussion, we do not challenge the District Court's findings as to what actually occurred.

<sup>9</sup> Bell conceded as much. It stated on page 31 of its main brief filed with the District Court that "the hysteresis effect found in transistors \* \* \* *has nothing to do with the success or failure of the process used to fabricate the transistors*" (emphasis added).

so long as those efforts somehow were connected to the project as a whole or were directed to enhancing the commercial utility of the invention.<sup>10</sup> The Third Circuit affirmed the District Court's departure from established legal standards, and upheld its findings of fact made under the more expansive standard. App. 28a.<sup>11</sup> The lower courts' decisions are completely at odds with the previously discussed principles of patent law and with every other tribunal that has considered the issue.

<sup>10</sup> The court's statement that the various efforts relating to the overall invention-project could not be "readily subjected to rigid compartmentalization" is immaterial to the legal issue Petitioner is raising before this Court. The only "compartmentalization" at issue is the separation of these efforts which *were* directed to reducing the invention to practice from those that were *not*. The court itself performed such a compartmentalization to the extent of finding that efforts devoted to the hysteresis problem were *not* directed to reduction to practice. App. 11a. It thus erred as a matter of law in nevertheless treating those efforts as part of the "reasonable diligence" requirement.

Even if the District Court's "compartmentalization" reference were relevant—which it is not—it ignores the rule of law established without exception that the party attempting to prove "reasonable diligence" itself carries the burden of proving such diligence by a preponderance of the evidence, and if its own proof *cannot* compartmentalize the relevant time period, so that each piece of work and each time sequence can be accounted for, such party fails in its proof. *E.g.*, *Gould v. Schawlow*, 363 F.2d 908, 916 n.6, 918, 921 (C.C.P.A. 1966), and cases cited *supra* notes 5 and 6. "The party chargeable with diligence must account for the entire period during which diligence is required." *Gould v. Schawlow*, *supra*, 363 F.2d at 919.

<sup>11</sup> On appeal, the Third Circuit rejected Hughes' contention that the efforts directed toward solving the hysteresis problem had to be excluded from "reasonable diligence" consideration as a matter of law. Notwithstanding the District Court's factual determination that the hysteresis-related work was not necessary to reducing the invention to practice, the Third Circuit nevertheless affirmed the District Court's decision by finding such work "sufficiently within that area [of reduction to practice] to constitute reasonable diligence." App. 28a. The court therefore did not simply affirm findings of fact; it necessarily approved the broader, unprecedented legal standard of "reasonable diligence" as adopted by the District Court.



In addition to presenting a conflict between Circuits—with all its attendant potential for forum-shopping and confusion in the application of a federal statute—the Third Circuit decision threatens serious harm to our basic patent system of encouraging technological advancement for the public good. If an inventor who is first to conceive an advancement were assured that he could not be foreclosed from a patent by those who thereafter enter the field, he has, inherently, less incentive to reduce to practice and eventually to disclose his invention in a patent. Indeed, so long as work related to the invention-project is in some manner continued, even though disassociated from the patentable improvement, an inventor under such a rule of law could effectively monopolize an inventive area for as long as he chose. He would not be subject to the policy of the patent law encouraging swift disclosure; he would not need to share his advancement so that others might be stimulated to advance the art still further; and he would be able to extend almost indefinitely the expiration date of his statutory patent term. The public would be the loser.<sup>12</sup>

<sup>12</sup> Obviously, the rate of progress of technological development would be greatly impeded if inventors could deny the fruits of their work to colleagues. The technological area of the SGFET itself presents a good example of the need for rapid interchange of ideas to spur technological growth. According to the Patent Office, some 2181 patents have been granted to inventors in the narrow technological field in which the SGFET invention is classified. Of these, 75% (1531) were issued on applications filed after Hughes made its application in late 1966. Thereafter, around 160 applications that ultimately matured into patents were filed each year through 1974. Quite clearly, the rapid progress of this art depended upon prompt disclosure of prior innovations to others and the diligence of inventors in filing their applications. United States Department of Commerce, Patent & Trademark Office, Office of Technology Assessment & Forecast [hereafter OTAF], *Special Report on SGFE Transistors 6* (1978).

2. The Circuit Court's decision relying on noncontemporaneous evidence from inventors to prove "reasonable diligence" conflicts with the rule in other Circuits and violates public policy.

*A. There is a conflict in the Circuits.*

The Third Circuit acknowledged in its opinion below the general rule that "uncorroborated testimony of an inventor on essential issues of priority is highly suspect and such testimony should, therefore, generally be supported by corroborating evidence \* \* \*." App. 29a. What the appellate court ignored, however—and indeed compounded—is the considerable confusion that exists in this area of law as a result of the conflict between the different Circuit Courts concerning the type of corroboration required by this rule.

As the Court of Customs and Patent Appeals has summarized the basic principle, "in interference cases a claimant, no matter how honest and truthful he may be, cannot prevail upon the basis of his own oral testimony standing alone. The rule which requires corroborating evidence is inviolable \* \* \*." *Allen v. Blaisdell*, 196 F.2d 527, 529 (C.C.P.A. 1952). The interpretation and application of this general principle, however, have produced widely divergent rules in the various Circuits.

Some courts—including those in the First and Fourth Circuits, the Court of Claims, and, in some instances, the Court of Customs and Patent Appeals—hold that an inventor's own documentary evidence will not suffice as "independent" corroboration for his oral testimony. These courts reason that such evidence is self-serving in the same way that the inventor's oral testimony is self-serving, that it suffers from the same infirmities that make such oral testimony unreliable, and that it there-

fore cannot be characterized as being the requisite independent corroboration.<sup>13</sup>

Likewise insufficient under this approach is oral testimony either by the inventor's co-workers, *Rex Chainbelt, Inc. v. Borg-Warner Corp.*, 477 F.2d 481, 490-491 (7th Cir. 1973), or by witnesses who possess no independent knowledge regarding the inventor's alleged activities but who simply relied on what the inventor previously had told them.<sup>14</sup>

The Court of Claims, in its recent decision in *Lockheed Aircraft Corp. v. United States*, *supra*, summarized the rule in these cases:

[I]t is well established that the burden of proof of an inventor's alleged conception and reduction to practice is a heavy one requiring full corroboration by other than the inventor's own self-serving testimony or records. In fact, this court has held that oral recollections of long past events, unsupported by contemporaneous documentary evidence, are insufficient to meet the strict burden of proof required. [553 F.2d at 74; emphasis added; citations omitted.]

However, other courts, namely those in the Second and Sixth Circuits, and, on occasion, the Court of Cus-

<sup>13</sup> E.g., *Potter Instruments Co. v. ODEC Computer Systems, Inc.*, 370 F. Supp. 198, 206 (D.R.I.), *aff'd*, 499 F.2d 209 (1st Cir. 1974); *Cleeton v. Hewlett-Packard Co.*, 343 F. Supp. 1215, 1221 (D. Md. 1972), *aff'd*, 475 F.2d 1399 (4th Cir. 1973); *Lockheed Aircraft Corp. v. United States*, 553 F.2d 69, 74 (Ct. Cl. 1977); *Senkus v. Johnston*, 166 F.2d 597, 599 (C.C.P.A. 1948); *Thurston v. Wulff*, 164 F.2d 612, 617 (C.C.P.A. 1947); *Crane v. Carlson*, 125 F.2d 709, 712-713 (C.C.P.A. 1942).

<sup>14</sup> *Laminex, Inc. v. Fritz*, 389 F. Supp. 369, 383 (N.D. Ill. 1974); *Gortatowsky v. Anwar*, 442 F.2d 970, 971-972 (C.C.P.A. 1971); *Gould v. Schawlow*, *supra*, 363 F.2d at 919-920; see *Globe-Union, Inc. v. Chicago Telephone Supply Co.*, 103 F.2d 722, 730 (7th Cir. 1939).

toms and Patent Appeals, have concluded that an inventor's contemporaneous documentary evidence may be legally sufficient to corroborate his oral recollections, and that such evidence should be judged by a "rule of reason."<sup>15</sup> Illustrative of this approach is the following language from the court's opinion in *Ritter v. Rohm & Haas Co.*, *supra*:

When the validity of a patent turns on the exact date a certain event occurred, or discovery was made, there is an inherent risk of perjury if after-the-fact oral testimony by the most interested party, the alleged inventor, can carry the invention date back beyond the filing date.

\* \* \* [The inventor's] notebook, a document of uncontested authenticity, is a contemporaneous record of his thoughts and actions. It is hard to imagine what more reliable corroborative evidence could be found.

\* \* \*

Memories are fallible, particularly in trying to recall the precise date of long forgotten events whose importance is only subsequently created by the Byzantine nuances of litigation. To rule out [the inventor's] notebook on the ground that it is "self-serving" is to exalt labels over reason. [271 F. Supp. at 320, 321; footnote omitted.]

Faced with these directly conflicting interpretations of the corroborative evidence rule, the Third Circuit in the instant case took still another approach. Declaring that "corroborating evidence need not take any particular form" (App. 29a), the appellate court affirmed the

<sup>15</sup> *Campbell v. Spectrum Automation Co.*, 513 F.2d 932, 937-938 (6th Cir. 1975); *United Shoe Machinery Corp. v. Brooklyn Wood Heel Corp.*, 77 F.2d 263 (2d Cir. 1935); *Ritter v. Rohm & Haas Co.*, 271 F. Supp. 313, 320-321 (S.D.N.Y. 1967); *Breuer v. De Marinis*, 558 F.2d 22, 29 (C.C.P.A. 1977); *Mikus v. Wachtel*, 542 F.2d 1157, 1159-60 (C.C.P.A. 1976).



trial judge's holding that oral testimony of inventors is sufficiently corroborated if supported by oral testimony of co-inventors and by *noncontemporaneous documents* prepared by the inventors themselves.<sup>16</sup>

By concluding that such evidence was legally sufficient to prove Bell's case, the Third Circuit not only has taken a stance in conflict with the *per se* rule in the First and Fourth Circuits and the Court of Claims, but it has confirmed a case far outside the "rule of reason" approach of the Second and Sixth Circuits. In so doing, the Third Circuit has unacceptably lowered the standards the law should require, and it has injected still more uncertainty into a critical area that can ill afford such ambiguity.

***B. Under facts such as are present here, public policy requires a rule prohibiting any consideration of inventors' noncontemporaneous evidence as proof of "reasonable diligence".***

The instant case demonstrates graphically the need for a new rule which will prevent large corporations, with extensive patent experience and expertise, from calling upon the courts to evaluate inherently unsatisfactory oral testimony from inventors in order to resolve complex, multi-million dollar controversies over patent priority.<sup>17</sup>

<sup>16</sup> The District Court's "corroborative evidence" included solely testimony from inventors (Sarace and Kerwin) and a co-worker (Edwards), plus two exhibits, both authored by the inventors. App. 12a n.13. One exhibit was a set of viewgraph slides of a talk given by Sarace in December 1966, and the other was a January 1967 intra-company memorandum. The first merely described the device and the second was a report on the status of work as of January. Neither exhibit related at all to the key question of what, if any, effort Bell expended on the project in the late fall of 1966.

<sup>17</sup> Such controversies are increasing. In 1976, the United States Patent and Trademark Office received over 100,000 applications for patents on mechanical, electrical, or chemical inventions, as compared with 76,500 in 1958. United States Department of Com-

Petitioner submits that the public interest in efficient and just administration of the patent laws requires that the current, conflicting versions of the corroborative evidence rule be modified so as to require that *only* contemporaneous, documentary evidence will suffice to prove prior inventive efforts, at least in cases, such as the instant controversy between Bell and Hughes, where the following three factors are present:

1. *A large, patent-wise corporation*—Bell is a sophisticated and experienced inventor. It employs hundreds of highly skilled scientists whose sole job is to create new devices and reduce them to practice.<sup>18</sup> Unlike the untutored technician working in his basement on his first invention, Bell and its employees are well aware from long experience of the necessity to document in detail every step in the inventive process. The company has been involved in numerous administrative and judicial battles over disputed inventions and is thus fully cognizant of the applicable requirements for proving inventive priority, reduction to practice and reasonable diligence.

merce, Patent & Trademark Office, *Annual Report of the Commissioner of Patents* 10 (1976). Approximately 9 per cent of such patents become involved in public protests, and a smaller number, around 1 per cent, become involved in interferences. United States Department of Commerce, Patent & Trademark Office, *Annual Report of the Commissioner of Patents* 1 (1975).

<sup>18</sup> The Patent Office reports that even in the narrow area covered by the patent in this case, Bell owns 96 patents, issued between 1963 and 1976. Only six other corporations have as many, including IBM, RCA and foreign-owned electronics companies. The patent in this case was only one of 15 that Bell received from applications filed on the SGFET technology in 1967. In 1969, when SGFET-related patents were first issued, Bell received 16, second only to IBM's 18. Bell consistently ranks at or very near the top in the nation for the number of patents owned in broader or related fields, such as Color Television (second after RCA), semiconductor computer memories (shares second place with others), and magnetic bubble computer memories (first with 48% of all patents). OTAF, *Special Report on SGFE Transistors* 6, 8 (1978); OTAF, *Special Report on Color Televisions* 8 (1977); OTAF, *Seventh Annual Report* 96, 118, 126, 144 (1977).

It not only admits but is proud of this fact. According to its own policy announcements, Bell is a careful keeper of records. Defendant's Exhibits 12, 13. This attention to detail is attested to by the fact that it did keep elaborate records of its work on this patent until October 17, 1966. J.A. 504.

2. *A gap in the documentation*—The District Court held that Bell presented to the court *no contemporaneous documentation* at all on its activities covering the important "reasonable diligence" period from October 17, 1966, until at least December 1966. App. 12a.

3. *Destruction of records*—It is undisputed pursuant to Bell's own evidence that important documents relating to the "reasonable diligence" period were destroyed and thus never presented in court. *E.g.*, J.A. 173-174, 242.<sup>19</sup>

Petitioner submits that when an inventor is aware of the necessity of keeping records, when it then totally fails to keep such records for a substantial amount of "reasonable diligence" time, and when the inventor later goes so far as to destroy records covering this crucial time period, public policy demands that *no noncontemporaneous evidence of any kind* be allowed to fill the "reasonable diligence" void. To hold otherwise would be to invite both perjury and the destruction of adverse documents.<sup>20</sup>

<sup>19</sup> For present purposes it makes no difference *why* the documents were destroyed; the key point is that they were in fact done away with. However, it is interesting that while Bell at first claimed that its documents were destroyed pursuant to its "document retention policy" (J.A. 242), it was then proven that the destruction was in fact in defiance of that policy. Bell's General Executive Instructions concerning the preservation of records (Defendant's Exhibit 12) required that laboratory notebooks be maintained for 30 years after the last entry, that laboratory reports be kept for 20 years, and that technical memoranda be kept permanently.

<sup>20</sup> Even in the absence of the special circumstances referred to above, this Court has repeatedly emphasized the unsatisfactory

We do not charge that fraud occurred in this case. Rather, the rule we seek simply takes account of the realities of the situation in which the witness, not subject to contradiction by contemporaneous documents, finds himself.<sup>21</sup> The point is that a rule allowing valuable—

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nature of oral testimony from an inventor trying to prove, years after the event, that he had effectively reduced to practice an invention for which another held a prior patent. See *The Barbed Wire Patent*, 143 U.S. 275, 284-285 (1892):

In view of the unsatisfactory character of such testimony, arising from the forgetfulness of witnesses, their liability to mistakes, their proneness to recollect things as the party calling them would have them recollect them, aside from the temptation to actual perjury, courts have not only imposed upon defendants the burden of proving such devices, but have required that the proof shall be clear, satisfactory and beyond a reasonable doubt.

\* \* \*

The very fact, which courts as well as the public have not failed to recognize, that almost every important patent, from the cotton gin of Whitney to the one under consideration, has been attacked by the testimony of witnesses who imagined they had made similar discoveries long before the patentee had claimed to have invented his device, has tended to throw a certain amount of discredit upon all that class of evidence, and to demand that it be subjected to the closest scrutiny.

<sup>21</sup> See *Deering v. Winona Harvester Works*, 155 U.S. 286, 300-301 (1894):

As we have had occasion before to observe, oral testimony, unsupported by patents or exhibits, tending to show prior use of a device regularly patented is, in the nature of the case, open to grave suspicion. *The Barbed Wire Patent*, 143 U.S. 275. Granting the witnesses to be of the highest character, and never so conscientious in their desire to tell only the truth, the possibility of their being mistaken as to the exact device used, which, though bearing a general resemblance to the one patented, may differ from it in the very particular which makes it patentable, are such as to render oral testimony peculiarly untrustworthy; particularly so if the testimony be taken after the lapse of years from the time the alleged anticipating device was used. If there be added to this a personal bias, or an incentive to color the testimony in the interest of the party calling the witness, to say nothing of downright perjury, its value is, of course, still more seriously impaired.



sometimes astronomically valuable<sup>22</sup>—patent rights to turn on vague, uncertain and speculative evidence produced years after the event invites litigation, raises at least the spectre of possible fraud, perjury or destruction of documents, and thus casts doubt on the whole adjudicative process.

Just as this Court and lower courts have not hesitated in other cases to bar evidence or to set standards on grounds of public policy because of the *possibility* of misconduct,<sup>23</sup> so here the Court should announce clearly and

<sup>22</sup> The dollar value of a patent is difficult to determine because owners keep the data confidential and because the calculations present many accounting problems. However, figures are available on the manufacture of all semiconductor devices, and the tremendous growth and dollar volume they disclose are good measures of the economic importance of the technological developments disputed here. In 1958, semiconductor devices were a \$250 million industry. Nine years later, when Bell filed its patent application, the industry had more than quadrupled to \$1.14 billion. By the time judgment was rendered in this case nine years later, the industry had almost quadrupled again, to \$4.47 billion, or about a quarter of one per cent of the whole economy. During the period from 1958 to 1976, semiconductor manufacturing grew 1687 per cent, six times faster than the economy as a whole. United States Department of Commerce, Bureau of the Census, *Census of Manufactures*, Industry Series Table 1a for SIC 3674 (1967); United States Department of Commerce, Bureau of the Census, *Annual Survey of Manufactures*, Industry Series Table 1a for SIC 3674 (1976); United States Department of Commerce, Bureau of Economic Analysis, *Survey of Current Business*, Table 1 (Dec. 1959); United States Department of Commerce, Bureau of Economic Analysis, *Survey of Current Business*, Table 1 (Dec. 1977). In this field, patent priority disputes are of great importance both because of the amount of money currently at issue and because of potential profit growth.

<sup>23</sup> For example, in *Hodgson v. Humphries*, 454 F.2d 1279 (10th Cir. 1972), an enforcement action under the Fair Labor Standards Act, testimony in lieu of legally required documents was held inadequate and inadmissible, where the employer had failed to create the documents. See also *Bergdoll v. Pollock*, 95 U.S. 337, 341 (1877) ("Certainly the law does not contemplate that [the defendant] may relieve himself from the effect of insufficient or improper [book-keeping] entries by a resort primarily to the uncertain recollection or knowledge of witnesses \* \* \*"). Various other exclusionary rules

strongly that an inventor in the position of Bell cannot carry its burden of proof by other than contemporaneous evidence. Given such a rule, companies like Bell would be more careful to create and maintain contemporaneous records (rather than just professing to do so, as Bell does now), and the task of the lower courts in future interference cases would be greatly simplified.

Petitioner has shown in Section A, above, that the lower courts are in hopeless conflict over the proper rule in this area. We submit that this Court should grant certiorari here in order to resolve that conflict and, at the same time, to establish a new rule that would limit large, patent-wise corporations to contemporaneous, documentary evidence in their efforts to establish priority of inventive efforts. Such a rule would implement the congressional intent and the public policies that underlie the patent field, and would streamline judicial administration in this important and frequently litigated area of the law.

exist either to protect the reliability of the trial process or to ensure some greater public benefit or avert some greater harm. See, e.g., *Mapp v. Ohio*, 367 U.S. 643 (1961); *Brown v. Financial Service Corp. Int'l*, 489 F.2d 144 (5th Cir. 1974); *Bailey v. Kawasaki-Kisten, K.K.*, 455 F.2d 392, 395-396 (5th Cir. 1972); *United States v. Georgia-Pacific Co.*, 421 F.2d 92 (9th Cir. 1970); *Vockie v. General Motors Corp.*, 66 F.R.D. 57 (E.D. Pa.), *aff'd*, 523 F.2d 1052 (3d Cir. 1975).

**CONCLUSION**

We respectfully urge the Court, for all of the reasons set forth above, to grant certiorari and to reverse the decision below.

Respectfully submitted,

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**APPENDIX**

1a

UNITED STATES DISTRICT COURT  
D. DELAWARE

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Civ. A. No. 74-238

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BELL TELEPHONE LABORATORIES, INCORPORATED,  
*Plaintiff,*

v.

HUGHES AIRCRAFT COMPANY and  
GENERAL INSTRUMENT CORPORATION,  
*Defendants.*

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July 19, 1976

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Richard F. Corroon, and Peter M. Siegloff, of Potter, Anderson & Corroon, Wilmington, Del. (Albert E. Fey, and Robert C. Morgan, of Fish & Neave, Edward Dreyfus, New York City, Peter V. D. Wilde, Murray Hill, N.J., of counsel), for plaintiff.

Thomas S. Lodge, of Connolly, Bove & Lodge, Wilmington, Del., Dugald S. McDougall, and Melvin M. Goldenberg, of McDougall, Hersh & Scott, Chicago, Ill. (Robert Thompson, Los Angeles, Cal., of counsel), for defendant Hughes Aircraft Co.



## OPINION

(Filed July 19, 1976)

Wright, Senior Judge.

Plaintiff, Bell Telephone Laboratories, Inc. ("BTL"), seeks relief under 35 U.S.C. Sec. 291<sup>1</sup> against defendants Hughes Aircraft Co. ("Hughes") and General Instruments Corp. ("G.I."). BTL alleges that an interference exists between its United States Letters Patent Number 3,475,234 (the Kerwin patent), and United States Letters Patent Numbers 3,544,399 (the Dill patent) and 3,576,478 (the Watkins patent), owned by Hughes and G.I. respectively. BTL seeks an adjudication of that interference and a declaration that it is the sole owner of the patent rights in interference.

This Court has jurisdiction under 28 U.S.C. Sec. 1338 (a). Since plaintiff, BTL, is a New York corporation and both defendants are Delaware corporations venue is proper under 28 U.S.C. Sec. 1391(c). Cf., *Standard Oil Co. v. Montecatini Edison, S.p.A.*, 342 F.Supp. 124 (D.Del. 1972).

Previously this Court has entertained a suit in which Hughes charged General Instruments with infringement of the Dill patent. General Instruments defended on the grounds, inter alia, that the Dill patent was invalid by reason of Watkins' prior invention. After separate trial on this priority issue, this Court held that although Watkins had conceived the invention in March of 1965, Watkins did not reduce the invention to practice until the filing of a patent application on November 17, 1966.

<sup>1</sup> 35 U.S.C. Sec. 291 provides:

The owner of an interfering patent may have relief against the owner of another by civil action, and the court may adjudge the question of the validity of any of the interfering patents, in whole or in part. The provisions of the second paragraph of section 146 of this title shall apply to actions brought under this section.

Dill, however, was found to have conceived on May 1, 1966, and to have reduced to practice constructively by the filing of a patent application on October 26, 1966. Since Watkins was the first to conceive but the last to reduce to practice, his diligence from Dill's conception until his own filing was necessary to a finding that he was the prior inventor. No such diligence was found and Hughes prevailed. *See Hughes Aircraft Co. v. General Instruments Corp.*, 374 F.Supp. 1166 (D.Del. 1974). Before further proceedings on the remaining validity and infringement issues in that case occurred, the present suit was filed by BTL.

At an early stage in these proceedings, Hughes moved for dismissal on the ground that no interference existed. This Court was unwilling to hold on the record then extant that the patents were non-interfering. Accordingly that motion was denied. 185 U.S.P.Q. 660. G.I. participated in the briefing of that motion and urged that a three-way interference existed. However, as a result of a settlement agreement with Hughes, G.I. ceased participating in these proceedings prior to the argument on the Hughes' motion. *See* 185 U.S.P.Q. at 661.

Following denial of the dismissal motion, Hughes dropped its position that the Kerwin and Dill patents were non-interfering and the case proceeded to trial on the merits. The matter is now ready for decision.

The purpose of a suit under 35 U.S.C. Sec. 291 is to establish priority of invention as between patentees. Priority is determined by the standard found in 35 U.S.C. Sec. 102(g):

... In determining priority of invention, there shall be considered not only the respective dates of conception and reduction to practice, but also the reasonable diligence of one who was first to conceive and last to reduce to practice, from a time prior to conception by the other.



In the instant suit, the parties have stipulated to the Hughes dates determined by this Court in the Hughes v. General Instrument infringement action.<sup>2</sup> The parties therefore presented this Court with proofs only respecting BTL's dates of conception and reduction to practice. In the event that the Court were to determine that the Kerwin invention was conceived prior to May, 1966, and reduced to practice after November 17, 1966, BTL also sought to show that the Kerwin inventors exercised diligence from prior to May, 1966 until such time as they had achieved a reduction to practice.<sup>3</sup>

The invention in the priority contest is directed to a semi-conductor device known as a "silicon-gate field effect transistor". ("SGFET"). A field effect transistor ("FET") is a three-electrode electronic amplifier formed in a small semi-conductor. The semi-conductor is usually silicon and is referred to as a "slice", "chip", or "wafer". The three electrodes are known as the "source", "drain", and "gate". The source and the drain electrodes are formed in the silicon wafer by "doping" selected portions of the wafer with selected impurities. The area separating the source and drain is known as the "channel", and normally will resist the flow of current. However, in an FET, the channel is overlaid with an insulating layer, and the gate electrode is formed on top of that layer.

<sup>2</sup> The Dill invention was conceived on May 1, 1966, and reduced to practice with the filing of the patent application on November 17, 1966.

<sup>3</sup> BTL did not attempt to prove a date of conception prior to March of 1965, the date of conception awarded to G.I. 374 F.Supp. 1171. However, since BTL was not a party to the prior suit, it is not bound by any of this Court's findings in that action. Further, there was no attempt here to establish G.I.'s March 1965 date. Accordingly, this Court need not address the issue of whether, under 35 U.S.C. Sec. 102(g), a March 1965 conception by G.I. would moot the issue of BTL's diligence, assuming BTL conceived before Hughes, but after March 1965, and reduced to practice after November 17, 1966.

When an appropriate voltage is applied to this gate, current is able to flow along the previously resistant path between the source and drain. Further, variations in the voltage applied to the gate will result in variations in the current flowing between the source and drain.

Prior to the development of the invention in suit, a major problem in fabricating these devices was the positioning (or alignment) of the gate electrode. The devices are of very small dimensions and it was desirable to make them even smaller. It accordingly was very difficult to align precisely a strip of metal (usually aluminum) on top of the insulator which overlaid the channel separating the source and drain.

The SGFET avoided this alignment problem completely by virtue of its so-called "self-alignment" feature. To effect self-alignment, a silicon layer is positioned over the insulating layer covering the channel on the chip prior to forming the source and drain regions. The doping or diffusion step which results in formation of the source and drain is then performed. The silicon acts as a "mask" during this step and prevents doping of the channel region. The source and drain are thus formed precisely at the edges of the silicon gate, and the gate itself becomes sufficiently doped to become a conductor and thus act as an electrode.

This sequence, performing the diffusion step after placement of the gate electrode, had been impossible using the prior art, for the metal gates, usually aluminum, would melt at the temperatures required for diffusion. The Work At Bell Telephone Laboratories.

Work on a SGFET by the Kerwin<sup>4</sup> group can be traced to a meeting held at BTL in February, 1966. The

<sup>4</sup> The named inventors on the BTL patent are Robert E. Kerwin, Donald L. Klein and John C. Sarace. At all relevant times, Klein was supervisor of the group which included Kerwin and Sarace. (PX-3; T-43-44, 275, 680) Since Kerwin was the first-named inventor, the Court as a matter of convenience uses the terms "Kerwin group" and "Kerwin invention".

meeting was called by Donald Klein, and was attended by members of his research group, as well as by other BTL technical personnel. Kerwin and Sarace were among those attending the meeting. (T-49, 278, 680)

The purpose of the meeting was to discuss problems which arose in making integrated circuits composed of large numbers of solid state devices. A significant problem respecting "yields" was always present in the manufacture of the circuits in a multi-step process. Even when each step in a process was highly efficient and resulted individually in a high yield, after a sequence of many such steps had been performed on a given device array, the percentage of operative devices in the area would be unsatisfactorily low. To overcome this problem, Klein hoped that his group would be able to come up with a so-called "go, no-go" sequence of device fabrication steps. A sequence of "go, no-go" process steps could approach 100% efficiency for it envisaged the use of materials which either would or would not be subject to reaction in a given chemical process step. (T-45-47; 49-50)

During the course of this meeting, at which a variety of potential process steps were discussed, Kerwin came to the key realization that placement of a thermally resistant gate prior to doping of the source and drain regions would eliminate the problems encountered in aligning the gate electrode. (T-280-85) Silicon, a material with which the group had experience, was the thermally resistance material chosen. (T-286) The SGFET fabrication process which resulted from this meeting was recorded by Klein (PX-10). Somewhat later, in early March, following discussion between Klein and his superior Hugh M. Cleveland, the latter developed a chart detailing the work assignments that would be involved in carrying out the project. (PX-15; T-576-77) In

summary, the fabrication sequence involved the following steps:<sup>5</sup>

1. Preparation of a silicon chip. This step, while rather involved and time consuming, is only the preparation of starting materials. It does not relate directly to the invention.

2. Deposition of an insulating layer on the upper surface of the chip. The parties disagree on which insulating materials were initially embraced by the Kerwin group. Without question, silicon nitride was the insulator of choice by those at the February meeting. The contemporaneous evidence, however, convinces this Court that silicon nitride was not the only insulator considered. Reference to silicon nitride was somewhat equivocal, e.g., Klein's notes (PX-10) in reference to this insulating layer, contains the notation "(Si<sub>3</sub>N<sub>4</sub>?)" and Cleveland's notes (PX-15) expressly indicate that an alternative to silicon nitride was considered. This alternative insulator was a layer of silicon oxide over the silicon, followed by a layer of silicon nitride. This two layer insulating medium is referred to as a "sandwich". See Fig. 1, Appendix.

3. Deposition of a layer of silicon oxide on top of the insulating layer. See Fig. 2, Appendix.

4. The selective etching away of the silicon oxide layer from the surface of the chip. This etching was to be effectuated by a so-called photoresist technique. The photoresist technique is used to place a plastic film over a portion of the surface of the device.<sup>6</sup> The plastic film

<sup>5</sup> The following enumeration of steps is somewhat arbitrary. Further, the list is not all inclusive; steps of minor relevance to the discussion have been deleted. This fabrication sequence is also found in the Kerwin patent. (PX-1)

<sup>6</sup> This technique, old in the art, involves coating the entire surface of the chip with a plastic material having photochemical properties. A photographic "mask" containing appropriate apertures could then be placed over the surface. The masked chip is



then functions as an etch mask for the subsequent removal of undesired portions of the underlying silicon oxide layer. *See* Fig. 3(A), Appendix. This is possible because certain agents which will dissolve silicon oxide, e.g., ammonium bifluoride, will be unreactive to the plastic film. Further, the ammonium bifluoride will have little effect on the underlying silicon nitride layer—thus in the jargon of the BTL group, the etch process would be “go, no-go”—go as to the silicon oxide and no-go as to the silicon nitride.

The remaining portions of the photoresist material are then removed. *See* Fig. 3(B), Appendix.

5. Deposition of a silicon layer across the entire surface. *See* Fig. 4, Appendix.

6. Placement of a plastic film by photoresist procedure over selected portions of the silicon layer, followed by etching away of a portion of the silicon layer with a mixture of hydrofluoric, nitric and acetic acids saturated with iodine. This mixture has little effect on the layers underlying the silicon. Subsequently the plastic film is removed by suitable solvent. *See* Fig. 5, Appendix.

7. Removal of exposed silicon oxide by use of ammonium bifluoride which will remove exposed  $\text{SiO}_2$ , but have little effect on silicon or silicon nitride. *See* Fig. 6, Appendix.

8. Removal of the silicon nitride layer by use of hot phosphoric acid, a solvent to which the underlying silicon or, in the case of the sandwich, silicon oxide, is impervious. In the case of the sandwich, underlying silicon oxide must then also be removed, again using ammonium bi-

then exposed to light, the light being allowed to strike only those areas of the chip on which it is desired to have the plastic film remain. Following exposure to light, the unexposed portions of the plastic film are removed with an appropriate organic solvent, with the exposed portions of the plastic film remaining intact.

fluoride. In these etch steps, the silicon gate functions as an etch mask over the underlying insulator. These etch steps are followed by the diffusion or “doping” step, which results in formation of the source and drain electrodes. During this latter procedure, the silicon gate acts as a diffusion mask. *See* Fig. 7.

9. Metallization. This step involves placement of metal on the electrode surface. This is required in order to facilitate attachment of wires to the device.

Following the February meeting, BTL investigators immediately began to try to produce field effect transistors using the newly devised fabrication sequence. Many of the individual steps in the process, however, were time-consuming, though routine. Accordingly, the first semi-completed devices were not tested until late May or early June of 1966. The devices which were then tested employed a single silicon nitride layer, and not the sandwich, as a gate insulator. Further, these devices were not “metallized”. That is, the devices did not have metal covering the electrode surfaces for the attachment of wire leads.

Accordingly, the devices were tested using a so-called probe test.

A probe test involves the physical placement of wires against the electrode surfaces—the physical placement being facilitated by holding the device array in a clamp and moving wire probes with a micrometer-like screw down onto the appropriate surface locations. The operator performing the test peers through a microscope while making contact to ascertain that the wires are being held against the desired electrode. (T-194-99)

The late May-early June probe tests of the nitride devices were clearly successful. The tests showed a “transistor effect”, i.e., they showed drain-to-source current as a function of drain-to-source voltage for different ap-



plied gate voltages, which curves were within a commercially accepted range; and the tests showed this result was true for a high proportion of the devices tested. (PX-24)

After the probe tests were performed, Sarace attempted to metallize the devices. The conventional procedure would have been to use a so-called "aluminization" process. The parties agree that such a process would have been routine and its effectuation would have been within the purview of one of ordinary skill in the art.<sup>7</sup> Sarace, however, elected to perform a "platinization" procedure.<sup>8</sup> This procedure was somewhat experimental but was also a more rapid and convenient procedure. (T-81, 151).<sup>9</sup> Unfortunately for Sarace, the platinization procedure, which was performed in late June 1966, produced only "shorted" devices. (PX-16 at 56; T-741-42)

Up until this time, work on the silicon gate project had required the efforts of several individuals. From this time on, however, Sarace was the only BTL employee to be assigned essentially full-time to the project. (T-703-03, 732, 788) Following the failure with platinization,

<sup>7</sup> Although Dietrich A. Jenny, testifying for Hughes, agreed that the process itself would have been routine, he testified, in effect, that the outcome could not have been predicted with certainty. (T-880-81, 888)

<sup>8</sup> Sarace did not actually perform the platinization step himself. That procedure was performed by others at BTL at his request. (See Dx-16 at 16; T-691-92.) Similarly, an aluminization would have been performed by others. (T-714)

<sup>9</sup> The platinization procedure in essence involved the vacuum deposition of metallic platinum over the surface of the device followed by a heat treatment. The heat would convert any platinum over silicon into platinum silicide, a conductor. Following this formation of platinum silicide over exposed silicon, the wafer could be washed with aqua regia to remove unreacted platinum. (T-79-81, 347-48) In contrast, an aluminization procedure would be more time consuming for it would involve photolithographic masking operations.

Sarace did not immediately switch to a conventional metallization procedure. Rather, he performed a microscopic examination of the shorted device in an effort to determine the source of the shorts. This examination failed to reveal the source of the shorts, but it did disclose an over-etching step. (PX-16 at 56) Although this over-etching had apparently not been exemplified in prior tests of the electrical characteristics of the devices, Sarace proceeded with a series of tests aimed at developing more precise etching-step parameters. This phase of Sarace's work continued into August of 1966. In addition, Sarace worked on several other problems affecting the devices.<sup>10</sup>

During the course of his work on these problems, Sarace became aware of a further problem, a hysteresis effect on the devices having a silicon-to-silicon nitride interface.<sup>11</sup>

Hysteresis can be considered a type of electrical instability.<sup>12</sup> While hysteresis did not make these devices totally unsatisfactory, it was a deficiency which it was desirable to overcome. Accordingly, Sarace directed his efforts to overcoming the hysteresis problem. A solution to the hysteresis problem was somewhat elusive. Sarace's

<sup>10</sup> These problems included, *inter alia*: (1) overly high "P-channel thresholds" initially thought to be caused by improper cleaning techniques, but which were solved by use of a hydrogen anneal (T-710-11); and (2) the failure of the photoresist material to adhere properly to silicon. (T-709)

<sup>11</sup> Sarace explored this hysteresis effect using capacitors rather than SGFET's as a test vehicle. This was because capacitors containing a silicon-to-silicon nitride interface were easier to fabricate than were SGFET's, and tests of the electrical properties of such capacitors could be extrapolated to SGFET's. (T-712, 773-74)

<sup>12</sup> The hysteresis was exemplified by a displacement in plots of gate capacity vs. gate voltage which was observed when a plot that had been made while increasing voltages was compared with a plot made immediately thereafter, while decreasing voltages. See, e.g., PX-42 at 7.

notebook (PX-16) indicates that up until October 17, 1966 no solution to the hysteresis problem had been found.

There are no entries from October 17, 1966 until January 17, 1967 in the laboratory notebook of Sarace, the only BTL employee then devoting full-time to the SGFET project. The activities at BTL during this period are not recorded on a day-to-day basis and, therefore, must be gleaned from (1) the testimony of Sarace and others;<sup>13</sup> and (2) certain other supporting documents. The earliest dated documents showing a solution to the hysteresis problem are in form of viewgraph slides (PX-42) which were prepared in conjunction with a talk that Sarace gave at a meeting with another group of BTL workers in Allentown, Pennsylvania. This meeting was held December 9, 1966 (T-793), and the viewgraphs were presumably prepared shortly before that date. These viewgraphs slides show that sometime prior to December 9, Sarace had employed the so-called "sandwich" construction and that this construction had resulted in elimination of the hysteresis problem.

Another document which supports a November date of completion for a SGFET utilizing the sandwich construction is a memorandum dated January 5, 1967 (PX-48) sent from Mr. Biondi, the director of the electron device laboratory to Mr. Cave of the BTL Patent Department. Although the memorandum is over Mr. Biondi's signature, it was actually written by Kerwin. (T-326) This memorandum indicates that subsequent to a prior memorandum dated November 15, 1966 (PX-35), the "sandwich" process was employed; that the sandwich

<sup>13</sup> Klein testified to contact with Sarace during the period in which Sarace was the only BTL inventor working full-time on the silicon gate project. (T-166, 174) There was also testimony by other workers at BTL who had some minor recollection of contact with Sarace in connection with the SGFET project in the fall of 1966. *See, e.g.*, testimony of Roger Edwards. (T-503 D-504)

process improved electrical stability; and that sandwich-containing devices were undergoing life tests.

In life tests, the devices are subject to stress conditions, e.g., elevated temperatures, and periodically data is gathered from the devices to check for changing electrical characteristics; that is, the devices are placed in a furnace and removed at given intervals for electrical testing, then returned to the furnace for a further time interval. These life tests are used to indicate the "stability" and "reliability" of the devices. (T-152, 321-22) Also they would show whether a device would "last long enough to be useful". (T-231) These tests required, as a practical matter, that the devices first be metallized. (T-152, 714)

Not until January 1967 did the Patent Department at BTL commence preparation of a patent application directed to the Kerwin invention. The application was filed March 27, 1967.

#### The Existence Of An Interference

Although Hughes at one time acceded to BTL's position that an interference existed, the Court expressed reluctance to accept a stipulation on this question. Since the question of whether an interference exists may, in a Sec. 291 suit, be characterized as going to the Court's subject matter jurisdiction, the Court deemed it inappropriate for the parties to stipulate to the matter. The Court asked the parties to address themselves anew to the question of the existence of an interference in their post-trial briefs.

Hughes again contends that no interference exists, but the Court is of the view that the evidence in the record unequivocally supports the existence of an interference. As this Court noted in denying Hughes' dismissal motion, the allegedly interfering claims of the Dill and the



Kerwin patents differ in only one respect—the process claimed in the Dill patent recites a step of “etching away the exposed portions of said insulating layer”, while the corresponding step in the Kerwin patent reads “etching away the exposed portions of said insulating layer using said silicon layer as a mask”. (emphasis added). See 185 U.S.P.Q. at 661.

However, in Dill's original Invention Disclosure which he submitted to the Hughes' Patent Department, he referred to the use of the “Si layer as a mask”. (Pretrial Order Par. 27). Further, the parties agree that Dill correctly testified before this Court in the Hughes v. General Instruments trial that his invention did not require a separate masking step and that those skilled in the art would recognize that the silicon gate itself acted as an etch mask. (Pretrial Order Par. 33). Thus, this Court is satisfied that Claim 1 of the BTL patent and Claim 5 of the Hughes patent are, in fact, interfering.

After trial, Hughes advanced two additional arguments in support of the view that the patents were not interfering. First, Hughes contended that if the Dill process were modified to include the deposition of metal on top of the silicon gate, then that metal, and not the silicon, would act as an etch mask. There is no testimony or suggestion in the record, however, that indicates the Dill process has never been so practiced. Further, it is not evident to this Court that even if the process were so practiced that the metal would perform as the mask to the exclusion of the underlying silicon. Second, Hughes contended that the use of silicon as an etch mask in the Kerwin process refers to the use of silicon as a mask for the field oxide layer, which layer is lacking in the Dill process. Again, since the issue was raised after trial, the Court has no testimony in support of this view. However, as this Court understands the Kerwin process, the fact that silicon may act as

an etch mask for the field oxide does not diminish the fact that the silicon gate also inevitably serves as an etch mask with respect to the gate insulator. Accordingly, the Court finds that an interference for purposes of Sec. 291 does, in fact, exist.

#### Conception.

A “conception is the mental part of the process in arriving at invention”. *Electro-Metallurgical Co. v. Krupp Nirosa Co.*, 122 F.2d 314, 318 (3rd Cir. 1941). Conception is not, however, merely “the perception or realization of the desirability of producing a certain result; rather it is the perception or realization of the means by which the result can be produced.” 1 *Rivise and Caesar, Interference Law and Practice* Sec. 110 (1940). Further, this mental possession of the means must be such that completion or effectuation of the invention requires no more than routine skill. Accordingly, the need for extensive subsequent research will negate an earlier asserted date of conception. See *Alpert v. Slatin*, 305 F.2d 891, 894 (C.C. P.A. 1962). It is clear that at their February 1966 meeting, the BTL group did more than merely recognize a problem. Hughes argues, however, that the February conception was incomplete in that extensive research was required to reduce the February conception to practice. The BTL inventors acknowledged that at the time of the February meeting, they were uncertain of their ability to carry out certain of the process steps envisaged in their conception. See, e.g., T-287. Viewing the events after the fact, however, this Court is convinced that BTL inventors faced no problems in pursuing a reduction to practice which required the use of inventive skill. That is, while it was impossible in February 1966 to state with certainty that the BTL process would work, events would show that the process did work. Further, while the process of reducing the invention to practice was lengthy,



this was not primarily the result of extensive experimentation required for a successful reduction to practice. Many of the individual process steps, though old in the art, were quite time consuming. Further, much of the experimentation was directed to solving the hysteresis problem, a problem which in itself would not have precluded a successful reduction to practice.<sup>14</sup> Accordingly, this Court is convinced that BTL has met its burden of proof<sup>15</sup> respecting its entitlement to a February-March conception date.

#### Reduction To Practice.

"A process is said to be reduced to practice when the series of steps constituting the process are carried out in such a manner as to demonstrate the practicability of the process." *Rivise & Caesar, supra*, Sec. 131 (citing *Corona Cord Tire Co. v. Dovan Chemical Corp.*, 276 U.S. 358 (1928)). Further, in the case of a product-producing process, a reduction to practice requires the establishment of utility for the products produced by the process. See, e.g., *Tennessee Valley Authority v. Monsanto Chemical Co.*, 383 F.2d 973, 977 (5th Cir. 1957). Accordingly, the date of BTL's reduction to practice is the date on which BTL can show that it produced a useful field-effect transistor using the silicon gate process.

<sup>14</sup> Hughes also argued that the February conception was deficient in that it did not envisage the use of the sandwich construction, which construction was ultimately used by BTL in their completed devices. As is clear from the discussion of facts *supra*, however, this Court is of the view that the sandwich construction is amply demonstrated in the documents that came out of the February meeting.

<sup>15</sup> The Kerwin inventors, who filed their application five months after Dill, would be the junior party in the Patent Office and thus have borne the burden of proof. 37 C.F.R. Sec. 1.257. Although it is not clear that the burden should always be so allocated in a Sec. 291 proceeding, where as here the junior party is also plaintiff, this Court has no burden concluding that such party should bear the burden of proof.

BTL contends that such a reduction to practice was shown by the probe tests in the period of late May to early June 1966. Hughes contends that the probe tests involved less than completed devices and, as such, they were insufficient to demonstrate a reduction to practice.<sup>16</sup>

There are a multiplicity of opinions dealing with the question of whether or not a given laboratory or bench test constitutes a reduction to practice in a particular case. See, e.g., *Rivise & Caesar, supra*, Sec. 143 and Sec. 144. The frequently stated rule is that "a test under service conditions is necessary in those cases, and in those only, in which persons qualified in the art would require such a test before they are willing to manufacture and sell the invention, as it stands." *Sinko Tool & Manufacturing Co. v. Automatic Devices Corp.*, 157 F.2d 974, 977 (2d Cir. 1946).

While this Court is convinced that the May-June 1966 probe tests constituted a successful intermediate experiment, BTL has failed to establish that those tests demonstrated that the devices possessed the utility required for a reduction to practice. The testimony of BTL's own inventors was that life tests of completed devices were necessary in order to demonstrate that the devices were reliable and useful.<sup>17</sup> These life tests establishing a reduction to practice were not completed until December 1966-January 1967.

<sup>16</sup> It is Hughes' position that a metallized device is a prerequisite to reduction to practice, notwithstanding the fact that the claims of the Kerwin patent do not encompass a metallization step, and that metallization was an established art.

<sup>17</sup> BTL urges that this Court's opinion in *Hughes Aircraft Co. v. General Instruments, Inc.*, 374 F.Supp. 1166, implies that successful, corroborated probe tests of an SGFET will suffice for a reduction to practice. This Court does not, however, read its prior opinion as so holding.

## Diligence.

Since BTL has established a date of conception prior to Dill's date of conception but has established a date of reduction to practice subsequent to Dill's date of reduction to practice, BTL can prevail only if the Kerwin group is found to have exercised reasonable diligence from just prior to Dill's conception up until their reduction to practice in December 1966-January 1967.

"The party chargeable with diligence must account for the entire period during which diligence is required." *Gould v. Schawlow*, 363 F.2d 908, 919 (C.C.P.A. 1966). Further, in making such account, the testimony of the inventor alone is usually deemed insufficient. *Id.* at 919; *Sletzinger v. Lincoln*, 410 F.2d 808, 812 (C.C.P.A. 1969).

There is no question that the Kerwin inventors were diligent from the time of their February-March 1966 conception up until the time of the probe tests in May-June 1966. In the second half of 1966, however, Sarace was the only inventor devoting full time to the project and his records show a substantial void, from October 17, 1966 until January 17, 1967. Sarace testified that it was in this period that he returned to the "sandwich" conception, and constructed and tested such a device, though his notes do not reflect this. However, certain other evidence does corroborate Sarace's testimony of fulltime efforts on the SGFET.

On December 9, Sarace presented viewgraphs with test data from sandwich devices to a meeting at Allentown, and this indicated that BTL workers had completed fabrication of these devices by late November 1966.<sup>18</sup> Further, the January 5, 1967 Biondi memoran-

<sup>18</sup> Such date would be required in order for Sarace to test the devices and prepare for the December 9 presentation. As indicated by the November 15, 1966 and January 5, 1967 Biondi memorandum (PX-35 and 48), sandwich devices had not been constructed before mid-November 1966.

dum (PX-48) indicates that the time-consuming life tests were then underway.

While a day-to-day corroboration of Sarace's testimony regarding his activity during the fall of 1966 would be desirable, this Court concludes that its absence is not fatal to BTL's case. It is sufficient that BTL has established by competent evidence an inference more reasonable than not that work on the silicon gate process continued uninterrupted from prior to Dill's date of conception until completion of the life tests which constituted a reduction to practice. The Court thus finds that BTL has met its burden of proof regarding the exercise of reasonable diligence.<sup>19</sup>

Accordingly, BTL is declared to be prior inventor of that subject matter common to the Dill and Kerwin patents.

Submit order.

<sup>19</sup> Hughes argued vigorously that the time spent by Sarace pursuing a solution to the hysteresis problem should not be credited toward reasonable diligence. This Court does not agree. Although there is authority in support of the view that diligence respecting one element of a combination is not diligence respecting the use of that element in combination with another, *Riche v. Permutit Co.*, 47 F.Supp. 275 (D.Del. 1942), that authority is not applicable here. In this Court's view, the silicon gate process, as it existed in the fall of 1966, cannot be readily subjected to rigid compartmentalization. Accordingly, Sarace's work on problems inhibiting commercial utilization of the process should be deemed reasonable diligence, whether that work encompassed the whole of the process, one step in the process, or an ultimately abandoned step.

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## APPENDIX

FIGURE 1



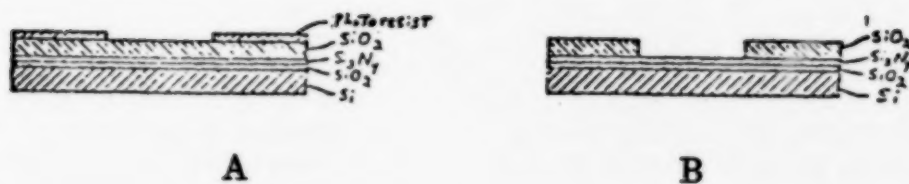
Schematic representation of (A), silicon (Si) chip on which a silicon nitride ( $\text{Si}_3\text{N}_4$ ) layer has been deposited and (B), silicon chip on which a silicon oxide ( $\text{SiO}_2$ ) layer has first been deposited, followed by a silicon nitride layer. Figure 1B represents the so-called sandwich construction. It is that construction which is depicted in all of the following figures.

FIGURE 2



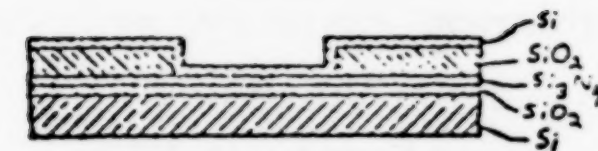
Schematic representation of device following completion of step 3.

FIGURE 3



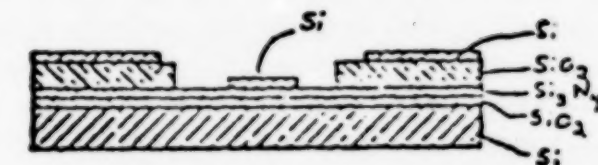
21a

FIGURE 4



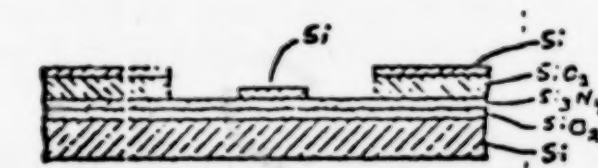
Schematic representation of device following step 5.

FIGURE 5



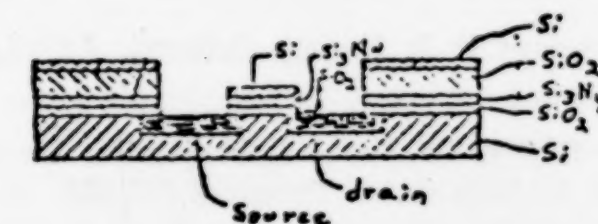
Schematic representation of device following step 6.

FIGURE 6



Schematic representation of device following step 7.

FIGURE 7



Schematic representation of device following step 8.



Schematic representation of (A) device following photoresist step and (B) device following etching of SiO<sub>2</sub> and removal of photoresist.

### FINAL JUDGMENT

(entered November 16, 1976)

This action under 35 U.S.C. Sec. 291 was filed November 11, 1974. At a hearing on March 17, 1975, defendant General Instrument Corporation represented in open Court that it was, in effect, giving up its Watkins Patent 3,576,478 involved in this interfering patents case. Thereafter General Instrument Corporation did not participate in the trial of this action and did not offer any evidence either to establish invention dates in favor of its own patentee or to challenge the invention dates of plaintiff's patentees.

The case was tried to the Court without a jury on November 17 to 21, 1975, fully briefed, and argued on March 16, 1976. The Court delivered its Opinion on July 19, 1976, setting forth its findings of fact and conclusions of law.

By motion filed September 7, 1976, General Instrument Corporation moved to reopen the case for the purpose of entering evidence of the conception and reduction to practice dates of the Watkins invention. The Court denied General Instrument Corporation's motion in its Opinion delivered October 26, 1976.

Now Therefore It Is Hereby Ordered, Adjudged And Decreed That:

1. Plaintiff Bell Telephone Laboratories, Incorporated is owner of United States Patent 3,475,234.

2. Defendant Hughes Aircraft Company is owner of United States Patent 3,544,399.

3. Defendant General Instrument Corporation is owner of United States Patent 3,576,478, General Instrument Corporation having admitted such ownership in its pleadings.

4. This Court has jurisdiction over the parties to this action.

5. This Court has jurisdiction over the subject matter of this action as between Bell Telephone Laboratories, Incorporated and Hughes Aircraft Company.

6. United States Patent 3,475,234 and United States Patent 3,544,399 are interfering patents within the meaning of 35 U.S.C. Sec. 291.

7. Robert E. Kerwin, Donald L. Klein and John C. Sarace the patentees of United States Patent 3,475,234, are prior inventors over the patentee of United States Patent 3,544,399 of that subject matter common to those two patents.

8. This judgment is a final judgment on priority of invention adverse to the patentee of United States Patent 3,544,399.

9. This Court has jurisdiction over the subject matter of this action as between Bell Telephone Laboratories, Incorporated and General Instrument Corporation, and United States Patent 3,475,234 and United States Patent 3,576,478 are interfering patents within the meaning of 35 U.S.C. Sec. 291, General Instrument Corporation having admitted such jurisdiction and interference in its pleadings.

10. General Instrument Corporation having failed to present a defense to this action, judgment against it by default, and not based upon any findings of fact respecting the dates of conception and reduction to practice of the invention of United States patent 3,576,478, is entered herein pursuant to Rule 55(b)(2) F.R.Civ.P.

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11. This default judgment is a final judgment adverse to the patentee of United States Patent 3,576,478 as to both affirmative and defensive use of that patent.

12. Plaintiff shall recover its costs in an amount to be determined, such costs to be borne equally by defendants for the period to and including March 17, 1975 and to be borne by Hughes Aircraft Company for the period after March 17, 1975.

So Ordered this 16th day of November, 1976.

Enter: November 16, 1976  
/s/ Caleb M. Wright  
Senior Judge

NOTICE OF APPEAL  
(Filed December 2, 1976)

Notice is hereby given that Hughes Aircraft Company, one of the defendants in the above-captioned action, hereby appeals to the United States Court of Appeals For The Third Circuit from the Final Judgment entered in this action on the 16th day of November, 1976.

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UNITED STATES COURT OF APPEALS  
FOR THE THIRD CIRCUIT

No. 77-1061

BELL TELEPHONE LABORATORIES, INC.

v.

HUGHES AIRCRAFT COMPANY and GENERAL  
INSTRUMENT CORPORATION

HUGHES AIRCRAFT COMPANY,  
*Appellant*

APPEAL FROM THE UNITED STATES DISTRICT COURT FOR  
THE DISTRICT OF DELAWARE  
(District Court Civil Action No. 74-238)

Argued September 6, 1977

Before SEITZ, *Chief Judge*, MARIS and GIBBONS,  
*Circuit Judges*

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OPINION OF THE COURT

(Filed October 25, 1977)

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MARIS, *Circuit Judge*

This is an appeal by Hughes Aircraft Corporation (herein "Hughes") from a final judgment of the district court in favor of the plaintiff in an action brought by Bell Telephone Laboratories, Inc. (herein "Bell") against Hughes and General Instrument Corporation to establish priority of invention as among their conflicting patents. Judgment by default having been entered against General Instrument Corporation, it is no longer involved in the case. Bell and Hughes hold interfering patents claiming the same invention, the Bell patent being Patent No. 3,475,234 applied for March 27, 1967 by Robert E. Kerwin, Donald L. Klein and John C. Sarace and issued October 28, 1969 to Bell as assignee, and the Hughes patent being Patent No. 3,544,399 applied for October 26, 1966 by Hans G. Dill and issued December 1, 1970 to Hughes as assignee. The judgment of the district court awarded

priority of invention to Bell over Hughes and it is that determination which Hughes attacks on this appeal.

The invention involves a process for manufacturing a type of electronic amplifying device commonly known as a silicon gate field effect transistor. Hughes concedes, and the district court found, that the invention was conceived by Bell's inventors in the period February-March 1966 and that Dill, the Hughes inventor, did not conceive the invention until May of that year. However, the parties also agree and the district court found that reduction to practice of Dill's invention took place not later than October 26, 1966 when he filed his patent application, whereas Hughes contended and the court found that reduction to practice of the Kerwin, Klein and Sarace invention did not take place until the period December 1966-January 1967. Therefore, in order to establish its claim to priority Bell sought to prove that it had exercised reasonable diligence in reducing the invention to practice.<sup>1</sup> The district court after considering the voluminous evidence offered on this issue found as a fact that Bell had exercised reasonable diligence in this regard during the significant period of time, May to December 1963, and awarded priority of invention to Bell. A more detailed description of the facts is contained in the opinion filed by Judge Wright in the district court, 422 F. Supp. 372, and need not be repeated here. Whether the finding of reasonable diligence was

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<sup>1</sup> 35 U.S.C. § 102 provides:

A person shall be entitled to a patent unless—

...

(g) before the applicant's invention thereof the invention was made in this country by another who had not abandoned, suppressed, or concealed it. In determining priority of invention there shall be considered not only the respective dates of conception and reduction to practice of the invention, but also the reasonable diligence of one who was first to conceive and last to reduce to practice, from a time prior to conception by the other.



erroneous is the specific issue which Hughes raises on this appeal.

The appellant accepts, as it must, the fact that Rule 52(a) F.R.C.P. requires this court to affirm the findings of fact of the district court unless we can say that they are clearly erroneous. Whether reasonable diligence has been exercised is a question of fact. *Electro-Metallurgical Co. v. Krupp Nirosa Co.*, 122 F.2d 314, 317 (3d Cir. 1941), *cert. denied*, 314 U.S. 699 (1942). Hughes contends, however, that the application of Rule 52(a) must be modified in this case and presents three arguments in support of that contention. First, it argues that the district court misconceived and misapplied the applicable legal standard as to what work constitutes reasonable diligence in such a situation. It is doubtless true that work quite unconnected with the reduction of an invention to practice cannot be considered.<sup>2</sup> But whether particular work is sufficiently connected with the invention to be considered to be in the area of reducing it to practice must be determined in the light of the particular circumstances of the case which may be as varied as the mind of man can conceive. It is thus peculiarly a question of fact for the finder of the facts to determine in the light of those circumstances. Here the district court found that the work performed by Bell was sufficiently within that area to constitute reasonable diligence. Our consideration of the record satisfies us that this finding was not erroneous, let alone clearly so.

The appellant next urges that as a matter of law Bell should not be found diligent in view of the fact that after June 1966 it cut back the number of staff members assigned to work on the invention. As to this, the record shows, and the district court found, that probe testing in

<sup>2</sup> *Riche v. Permutit Co.*, 47 F. Supp. 275 (D. Del. 1942), *affirmed per curiam*, 135 F.2d 922 (3d Cir. 1943), upon which the appellant relies, was such a case.

June 1966 indicated that the device produced by the process of the invention functioned successfully. What remained was the work of developing the process to a point where it would produce a commercially usable device, a task which did not necessarily require the work of as many staff members. Here again the question was one of fact for determination by the fact finder. We see no error in the district court's resolution of it.

Finally, the appellant urges that the district court should not have considered as evidence of reasonable diligence the oral recollection of the inventors uncorroborated by documentary evidence. While it has been held that the uncorroborated testimony of an inventor on essential issues of priority is highly suspect and such testimony should, therefore, generally be supported by corroborating evidence, *Campbell v. Spectrum Automation Co.*, 513 F.2d 932, 937-938 (6th Cir. 1975); *Gould v. Schawlow*, 363 F.2d 908, 919 (CCPA 1966), the corroborating evidence need not take any particular form, *MacMullen v. Santelli*, 326 F.2d 1008, 1013 (CCPA 1964), but may be either documentary or oral, *Allen v. Blaisdell*, 196 F.2d 527, 529, 531 (CCPA 1952). Since the function of the corroborating evidence is to assist the fact finder in deciding whether the inventor's testimony is credible, the question whether its amount and quality is adequate for that purpose is peculiarly for the fact finder to pass upon in the light of the circumstances of the case. *Mathieson Alkali Works v. Crowley*, 138 F.2d 281, 282 (D.C. Cir. 1943); *Bennett v. Serota*, 477 F.2d 1385, 1390-91 (CCPA 1973). Here the district court found that the testimony of the Bell inventors as to their work in reducing their invention to practice was sufficiently supported by corroborating evidence to be credited. We find no error in this regard.

In sum, we conclude from our examination of the record in this case that the district court did not err in its finding that Bell was reasonably diligent in reducing

its invention to practice. Accordingly, its determination that Bell as first inventor is entitled to priority for its patent must be sustained. Our conclusion makes it unnecessary for us to consider Bell's alternative contention in support of affirmance that it reduced its invention to practice in June 1966 when it made its successful probe tests, a date prior to Hughes' reduction to practice.

The judgment of the district court will be affirmed.

A True Copy:

Teste:

Clerk of the United States  
Court of Appeals for the  
Third Circuit.

Supreme Court, U. S.  
**FILED**

FEB 24 1978

MICHAEL RODAK, JR., CLERK

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IN THE  
**SUPREME COURT OF THE UNITED STATES**

OCTOBER TERM, 1977

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**No. 77-1040**

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HUGHES AIRCRAFT COMPANY,  
*Petitioner,*

vs.

BELL TELEPHONE LABORATORIES, INCORPORATED,  
*Respondent.*

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**RESPONDENT'S BRIEF IN OPPOSITION  
TO PETITION FOR WRIT OF CERTIORARI**

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IN THE  
Supreme Court of the United States

October Term, 1977

No. 77-1040

HUGHES AIRCRAFT COMPANY,

Petitioner,

vs.

BELL TELEPHONE LABORATORIES, INCORPORATED,

Respondent.

RESPONDENT'S BRIEF IN OPPOSITION  
TO PETITION FOR WRIT OF CERTIORARI

There is nothing about this ordinary patent interference which warrants review by this Court.

This is a straightforward action under 35 U.S.C. § 291 to determine priority of invention between interfering patents. The District Court and a unanimous Court of Appeals for the Third Circuit concurred in ruling that the Bell Labs inventors are entitled to priority of invention over Hughes' inventor because they first conceived the silicon-gate process for making field effect transistors and diligently reduced it to practice (App. 1a-30a).\*

Hughes' Petition raises only one issue: Did the Bell Labs inventors diligently reduce their invention to practice?\*\* The

\* "App." refers to the Appendix to the Petition. "Pet." refers to the Petition. Record citations will be to the Joint Appendix ("J.A.") filed by the parties in the Court of Appeals and to the exhibits in evidence for Bell Labs ("PX") and for Hughes ("DX").

\*\* Hughes concedes that the Bell Labs inventors conceived the silicon-gate process earlier than the conception at Hughes (Pet. 3). Under 35 U.S.C. § 102(g), the Bell Labs inventors are the prior inventors of the process and are entitled to the patent on it if (1) they reduced the process to practice before Hughes or (2) they reduced the process to practice after Hughes and exercised reasonable diligence in doing so. The parties stipulated below that the Hughes' process was constructively reduced to practice by the filing of a patent application on October 26, 1966 (J.A. 12). The District Court held that the Bell Labs inventors reduced the invention to practice in December 1966-January 1967, and that they exercised reasonable diligence from their conception up to the reduction to practice (App. 18a).

decisions of the Court of Appeals and the District Court, holding that they were diligent, are manifestly correct.

The lawsuit, in addition, involves a second issue: Whether or not the Bell Labs inventors reduced their invention to practice before the reduction to practice of Hughes and are therefore entitled to priority without regard to their diligence. The Court of Appeals, having found for the Bell Labs inventors on the diligence issue, found it unnecessary to decide this second issue (App. 30a).

Contrary to Hughes' assertions, there are no conflicts in Courts of Appeals' decisions on the question of diligence. The only conflicts—Hughes' own creations—are the gaping disparities between the rules of law which Hughes claims the Courts below applied and the rules of law which the Courts below actually did apply, and the disparities between the facts of this case and what Hughes claims the facts are.

No question of public importance is involved here. And there has been no departure from the usual and accepted course of judicial proceedings. In short, there is no reason, much less a special or important reason, for granting a writ of certiorari in this case.

### **Opinions Below**

The opinion of the Court of Appeals for the Third Circuit is reported at 564 F. 2d 654 (3 Cir. 1977). The opinion of the District Court is reported at 422 F. Supp. 372 (D. Del. 1976). The two opinions are printed in the Appendix to the Petition.

### **Jurisdiction**

The jurisdictional requisites are set forth in the Petition.

### **Questions Presented**

Hughes' two "Questions Presented" are so framed that they create the erroneous impression that the Court of Appeals and the District Court erred as a matter of law in holding that the Bell Labs inventors diligently reduced the silicon-gate process to

practice. But examined in light of the record, Hughes' questions are shown to be challenges to the findings of fact, made by the District Court and affirmed by the Court of Appeals, which support the award of priority of invention. Hughes seeks here, as it unsuccessfully sought in the Court of Appeals, to avoid the "clearly erroneous" standard mandated by Rule 52(a), F.R. Civ.P. for review of findings of fact.

Hughes' Question 1 suggests that the Court below erred as a matter of law in affirming the District Court's determination that the performance of certain development work was sufficiently connected to the invention at issue to constitute reasonable diligence. Hughes asserts that the Court below erred by applying a rule "that experimentation which is directed solely to enhancing the commercial desirability and utility of a particular invention, but which is not necessary for the invention's successful reduction to practice, nevertheless constitutes 'reasonable diligence' in reducing that invention to practice as required by 35 U.S.C. § 102(g)" (Pet. 2). The legal test which the Court actually applied is quite the opposite, namely,

"Whether reasonable diligence has been exercised is a question of fact. . . . It is doubtless true that work quite unconnected with the reduction of an invention to practice cannot be considered." (App. 28a)

No matter how Hughes phrases its challenge, the question it raises is a question of fact. The Court of Appeals affirmed the District Court's finding of fact that the Bell Labs work was sufficiently directed to reduction to practice to constitute reasonable diligence.

"Here the district court found that the work performed by Bell was sufficiently within that area to constitute reasonable diligence. Our consideration of the record satisfies us that this finding was not erroneous, let alone clearly so." (App. 28a)

Question 2 suggests that the Court below erred as a matter of law in affirming the District Court's finding of fact that testimony of the Bell inventors relating to their diligence was sufficiently corroborated. According to Hughes, the Courts below



applied the rules that inventors' diligence may be established "through their own uncorroborated, undocumented oral testimony and other noncontemporaneous evidence" (Pet. 2) and "by oral testimony of co-inventors and by *noncontemporaneous documents* prepared by the inventors themselves" (Pet. 20, emphasis by Hughes). The rule which the Courts below actually applied is again quite different. The District Court made its determination of diligence on the basis of "competent evidence" (App. 19a) which included, in addition to the testimony of the inventors and their contemporaneous documents, testimony and contemporaneous documents of others at Bell Labs. The Court of Appeals affirmed:

"Since the function of the corroborating evidence is to assist the fact finder in deciding whether the inventor's testimony is credible, the question whether its amount and quality is adequate for that purpose is peculiarly for the fact finder to pass upon in the light of the circumstances of the case. . . . Here the district court found that the testimony of the Bell inventors as to their work in reducing their invention to practice was sufficiently supported by corroborating evidence to be credited. We find no error in this regard." (App. 29a)

Again, not withstanding how Hughes phrases the question, its challenge goes to findings of fact made by the District Court and affirmed by the Court of Appeals.

To conjure up its non-existent questions of law, Hughes has misstated the record to fit its needs. Clarification is required; therefore, we turn to the record and to the correction of Hughes' misstatements.

### Statement Of The Case

The invention common to the interfering Bell Labs and Hughes patents is a process for manufacturing field effect transistors known as the silicon-gate process. A field effect transistor is a small three-electrode electronic amplifier which is used in electronic circuits (App. 4a). The process of the invention utilizes a "self-alignment" technique to eliminate the problem of position-

ing the gate electrode (which controls the amount of electric current flowing through the transistor) (App. 5a).

Hughes has conceded that the Bell Labs inventors, Robert Kerwin, Donald Klein and John Sarace, conceived the silicon-gate process in February-March 1966, before the May 1966 conception date of Hughes' inventor, Hans Dill (Pet. 3-4).

By June 1966, the Bell Labs inventors had conducted "clearly successful" probe tests on devices made by the silicon-gate process which showed that the devices displayed transistor activity in a "commercially accepted range" (App. 9a-10a). In contrast, as the District Court found in an earlier case involving the Hughes' Dill patent,\* Dill filed his patent application without ever achieving successful probe tests on devices made by the silicon-gate process (374 F. Supp. at 1170-71).\*\* It is undisputed that Hughes' work on the silicon-gate process before filing did not amount to an actual reduction to practice (374 F. Supp. at 1171). Dill filed his patent application on a process which he could only hope would work (PX-2).

Following the successful June tests, the Bell Labs inventors continued their work on the silicon-gate process. And during the period starting in mid-November 1966, Bell Labs began the time-consuming life tests which the District Court found established a reduction to practice in December 1966-January 1967 (App. 17a). Hughes did not below dispute that the Bell Labs inventors exercised reasonable diligence through June 1966 and that they were diligent after November 15, 1966 (Hughes' Brief filed with the Court of Appeals, p. 23).

Hughes challenge to Bell Labs' priority thus centers on work which took place at Bell Labs from about July 1966 until mid-November of that year. In its Petition, Hughes has mischaracterized that Bell Labs work. According to Hughes, Bell Labs'

\* *Hughes Aircraft Company v. General Instrument Corp.*, 374 F. Supp. 1166 (D. Del. 1974), cited in the District Court's opinion in this case at pages 2-3 of the Appendix to the Petition.

\*\* Nor had he performed any life testing of devices (See J.A. 12-14, Pretrial Order, ¶¶ C 14(a)-(i)).

employees in June, 1966 "postponed completion of testable devices in favor of experimentation directed at collateral goals" (Pet. 5). The undisputed and fully corroborated evidence shows otherwise; the Bell Labs inventors diligently pursued work directed to reducing the process to practice.

In June 1966, Bell Labs inventor Sarace, who had earlier spent 30-40% of his time on the silicon-gate process, began devoting 100% of his time to it (J.A. 599, 452, 469). His co-inventor Klein, consulted with Sarace on a daily basis (J.A. 116). The Bell Labs models laboratory, under Werner Bracht, continued devoting one man-day per day to the silicon-gate process up until about September. By that time, the various steps in the process had become sufficiently established that the work took less time, requiring one-half man-day per day into 1967 (J.A. 293, 298).

Bell Labs researcher Ronald Finne continued spending approximately 80% of his time on the silicon-gate process to the end of July when he left Bell Labs, at which time the models laboratory picked up and performed the work he had been doing (J.A. 283, 296). Bell Labs' Roger Edwards continued in his role as advisor to the inventors and assisted Sarace in performing electrical tests (J.A. 322-323, 116). Others at Bell Labs, including Messrs. Lieberman, Grieco and Hauser, deposited insulator films for Sarace to use in his work (J.A. 15-16, Pretrial Order, ¶¶ C 21, 22, 23, PX 16, p. 58, PX 18, PX 19, J.A. 421). Nigh tested Sarace's devices (J.A. 397-402). Finne, Bracht, Edwards, Cleveland, Nigh, Hauser and Biondi, all non-inventors, testified at trial concerning the work during this time period. In addition, the work of Lieberman and Grieco, as shown in their notebooks, was stipulated to by Hughes.

Sarace worked on several aspects of the silicon-gate process following the May-June 1966 probe tests, including etching, high threshold voltages on "P Channel" devices made by the process, problems with use of photo-resist materials in the process, and hysteresis (J.A. 591-592, n.10).

On September 16, 1966, Klein's supervisor, Cleveland, summarized the work to that date and the work then in progress in a

memorandum to his supervisor, Biondi. Cleveland noted that by that date approximately 10 slices of silicon had been processed to make both "P" and "N" Channel devices (PX 31, p. 3).

On September 20, 1966, following Cleveland's memorandum, the Bell Labs inventors met with their patent attorneys to discuss filing a patent application on the silicon-gate process.\*

Work done on a hysteresis problem led the inventors to conclude that the problem lay in the use of a silicon nitride insulator. Therefore, they used a different insulator in the process which avoided the hysteresis problem (J.A. 457, 110-111, PX 42). By late November, Sarace had finished devices which had this insulator.\*\* In about the last week of November, Sarace sent some of these devices, with metal leads attached, to Harold Nigh at Bell Labs' Allentown laboratory for testing (J.A. 397-402).

Sarace and Edwards performed tests on others of these devices and the life tests were begun (J.A. 458-461, 322-329, PX 41, PX 46, PX 47). Contemporaneous data sheets handwritten by Edwards and Sarace record some of these tests (PX 41, PX 46, PX 47). The inventors Kerwin and Klein also documented some of the work done in this period in handwritten memoranda (PX 44, PX 45).

On December 9, 1966, Sarace gave a presentation to colleagues at Bell Labs' Allentown facility at which he used in his presentation viewgraphs which showed the silicon-gate process and its development and which explained in detail the work which had been done (J.A. 599, 462-468, 391; PX 42).

These viewgraphs and the data sheets prepared by Sarace and Edwards show test results for the 84th, 85th and 86th silicon slices processed at Bell Labs in the silicon-gate work prior to that time (J.A. 461).

\* A formal write-up of the process was prepared sometime thereafter and was submitted to the attorneys on November 15, 1966 (PX 35).

\*\* The undisputed evidence establishes that, because of the many operations involved, it took between one to two months to process a device made by the silicon-gate process (J.A. 458, 173-174, 296).



The hysteresis problem was only one of the problems Bell Labs faced in developing the silicon-gate transistor process. Other development difficulties also included the problems of over-etching, photo resist materials, and high thresholds (App. 11a). Sarace and his co-workers set out to solve, and did solve, those problems during the period in issue.

Hughes now tells this Court, ten years after the fact, that the work at Bell Labs was "experimentation directed at collateral goals." What Hughes has done is to dissect the work done on the silicon-gate process, focus on a single aspect of that work—solving the hysteresis problem—and argue that such work was not a reasonable exercise of diligence. The District Court properly rejected Hughes' argument. Considered in light of the facts and circumstances of this case, solving the hysteresis problem was a reasonable exercise of diligence. As the Court found:

"While hysteresis did not make these devices totally unsatisfactory, it was a deficiency which it was desirable to overcome." (App. 11a)

The Court further found that the silicon-gate process, as it existed in the fall of 1966, could not readily be subjected to such rigid compartmentalization, as Hughes would have it, and further confirmed that the work done on the process in that period was a reasonable exercise of diligence (App. 18a-19a; n. 19).

The Court of Appeals affirmed these findings as not erroneous, let alone clearly so:

"The district court found that the work performed by Bell was sufficiently within that area [the area of reducing the invention to practice] to constitute reasonable diligence. Our consideration of the record satisfies us that this finding was not erroneous, let alone clearly so." (App. 28a).

The second prong of Hughes' argument is directed against the District Court's finding of fact, affirmed by the Court of Appeals, that the testimony of Bell Labs' inventors as to their work in reducing their invention to practice was sufficiently corroborated by "competent evidence." (App. 19a and 29a).

Following the pattern set in its argument with respect to diligence, Hughes has misstated the record, arguing that the Court below followed the rule that "oral testimony of inventors is sufficiently corroborated if supported by oral testimony of co-inventors and by *noncontemporaneous documents* prepared by the inventors themselves" (Pet. 20, emphasis by Hughes).

A prime example of this is at page 6 of the Petition where Hughes asserts that

"To reconstruct the events of the period between October 17 and some time in December, when the trial court held that reduction to practice may have occurred, Bell relied upon the almost ten-year-old recollections of the Bell inventors themselves, and of their co-workers, without the benefit of any written chronicle of Bell's activities."\*

Hughes is flatly wrong. The work of Bell Labs during this period is well corroborated by contemporaneous writings and testimony. It is summarized in the January 1967 entries in Sarace's notebook (PX 16); it is shown in the viewgraphs for Sarace's December 9, 1966 presentation (PX 42); in the test data recorded in Plaintiff's Exhibits 41, 46 and 47; in the November 15, 1966 and January 5, 1967 letters (PX 35, PX 48), in Kerwin's handwritten comparisons of work done at Bell Labs' Allentown, Pennsylvania, and Murray Hill, New Jersey facilities (PX 44), and in Klein's handwritten notes (PX 45).

Moreover, because it took one to two months to process each silicon slice made by the silicon-gate process, a notebook entry, a data sheet or other document recording tests results represents

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\* Hughes never makes clear in its Petition the period of time during which Bell Labs' activities are supported only by what Hughes contends to be "uncorroborated evidence" (Pet. 2). At one point Hughes refers to "the rest of the fall and early winter of 1966" (Pet. 5). Another reference is to the period from October 17, 1966 and "some time in December" (Pet. 6, 22). In its Brief filed with the Court of Appeals (p. 23) Hughes conceded that Bell Labs was diligent from November 15, 1966 through early January, 1977.



the culmination of many weeks' work, not just the work done on the day or days the tests were performed (J.A. 458, 173-174, 296).<sup>\*</sup> In addition, Bracht, Nigh, Hauser, Cleveland, Biondi and Edwards—all non-inventors—testified in corroboration of the work done (J.A. 286-438).

Significantly, Hughes itself did not below dispute, and here concedes (Pet. 6), that Sarace devoted 100% of his time to the silicon-gate process after the May-June, 1966 tests. Hughes' protestations about corroboration of that conceded 100% effort therefore have a hollow ring.

The bankruptcy of Hughes' assertions regarding the alleged lack of corroboration is made plain by Hughes' specific contention that "important" Bell Labs documents were destroyed (Pet. 22). This is the third time that Hughes has scraped the bottom of the barrel and made this *ad hominem* charge. Both Courts below rejected Hughes' charge out of hand. It should be likewise rejected here.

Hughes knows full well that no laboratory notebooks, no laboratory reports and no technical memoranda relating to this work were destroyed at Bell Labs.

Hughes also knows that the only "documents" relating to this work which were not preserved, were such things as laboratory routing slips, handwritten notes and rough data sheets—none of which are required to be retained by Bell Labs policies (J.A. 295; DX 12). And even as to these, Hughes knows that Bell Labs searched for them and that many were found among the witnesses' papers and produced. That Hughes must dredge up for the third time this discredited charge emphasizes the total lack of substance in its Petition.

<sup>\*</sup> This is confirmed by Hughes' own records. There are gaps of several weeks, and in some instances, of more than a month, between entries relating to silicon-gate work in the notebook of Hughes' inventor Dill (J.A. 12-14, Pretrial Order, ¶¶C 14(a)-(i)).

## Reasons For Denying The Writ

### 1. The Holding Of Reasonable Diligence Below Was Manifestly Correct

The Court of Appeals, inquiring into the question of reasonable diligence in this case correctly set forth the law as it stands in the Third Circuit and in other Courts of Appeals:

"Whether reasonable diligence has been exercised is a question of fact. . . . It is doubtless true that work quite unconnected with the reduction of an invention to practice cannot be considered. (App. 28a)<sup>\*</sup>

Hughes completely ignores this clear statement of the rule applied by the Court of Appeals, asserting that the Court of Appeals (and the District Court) followed the rule that:

"... work on problems related solely to commercial utilization and not to reduction to practice, can be deemed 'reasonable diligence' in reducing an invention to practice within the meaning of 35 U.S.C. § 102(g)." (Pet. 8)

Hughes' statement is diametrically opposed to the rule of law actually applied.

Stripped to its essentials, what Hughes urges is a new *per se* rule of law. Hughes' rule would require an inventor to reduce his

<sup>\*</sup> The principle that the question of diligence is a question of fact, is well established. *E.g., Martus & Becker v. Heise*, 39 F.2d 715, 717 (C.C.P.A. 1930): "The question of diligence is one of fact, and must be determined in each case in the light of the prevailing conditions and circumstances."; *S. & S. Corrugated Paper Mach. Co. v. George W. Swift, Inc.*, 176 F.2d 358, 361 (3 Cir. 1949): "The plaintiff, nevertheless, insists that the evidence requires a finding of diligence as a matter of law. But diligence in this field is historically a question of the conduct of the inventor, or other party who bears that burden, under the circumstances peculiar to his case. To attempt a legal formula would be travail without recompense." See also, *Electro-Metallurgical Co. v. Krupp Nirosa Co.*, 122 F.2d 314, 317 (3 Cir. 1941); *Eclipse Mach. Co. v. E. Krieger & Son*, 87 F.2d 755, 757 (2 Cir. 1937); *Rines v. Morgan*, 250 F.2d 365, 369 (C.C.P.A. 1957); *Shell Development Co. v. Pure Oil Co.*, 111 F.Supp. 197, 207 (D.D.C. 1953), *aff'd sub nom. Pure Oil Co. v. Socony-Vacuum Oil Co.*, 212 F.2d 454 (D.C. Cir. 1954) and *Harper v. Zimmermann*, 41 F.2d 261, 268 (D.Del. 1930).

invention to practice as soon as it reaches its crudest form and that he otherwise forfeit the invention no matter how reasonable his work may be in the circumstances. That is not the law. It has never been the law. And it should not become the law.\*

Contrary to Hughes' assertion (Pet. 9 n.4), the Court of Appeals for the Third Circuit has not "overruled" any of its earlier decisions. Indeed, both the Court of Appeals and the District Court specifically cited *Riche v. Permutit Co.*, 47 F. Supp. 275 (D. Del. 1942), *aff'd per curiam* 135 F. 2d 922 (3 Cir. 1943) (cited by Hughes at Pet. 9 n.4) and found the rule of that case to be inapplicable to the facts of the Bell Labs work (App. 19a, 28a).\*\*

Hughes devotes a significant portion of its argument to reviewing authorities which hold that efforts totally unrelated to reducing an invention to practice cannot be considered diligence (Pet. 12-13). Hughes begs the question by relying on these authorities, and fails to come to grips with the dispositive question of fact. As the Court of Appeals stated:

"... whether particular work is sufficiently connected with the invention to be considered to be in the area of reducing it to practice must be determined in the light of the particular circumstances of the case which may be as varied as the mind of man can conceive. It is thus peculiarly a question of fact for the finder of facts to determine in the light of those circumstances." (App. 28a)

The District Court made the factual determination that the development work which Hughes challenges as collateral was a reasonable exercise of diligence, and the Court of Appeals affirmed (App. 28a).

\* The cases Hughes cites as the supposed basis for this rule are cases in which a party was able to prove reduction to practice *despite* the fact that the invention was not perfected. None of these cases even suggests that an inventor is *required* to reduce the invention to practice in its crudest form.

\*\* The other case cited by Hughes, *S. & S. Corrugated Paper Mach. Co. v. George W. Swift, Inc.*, 176 F.2d 358 (3 Cir. 1949) is similarly inapplicable to the facts here. In that case, the dispositive issue was whether or not the work urged as diligence had been done at all, not the character of the work.

There are no conflicts here other than the conflict between the rule of law actually applied and the rule of law Hughes claims was applied. Hughes has no basis for challenging the finding of diligence.

## **2. The Holding That The Testimony Of The Bell Labs Inventors Was Corroborated By Competent Evidence Was Manifestly Correct**

In considering and affirming the District Court's finding of fact that the testimony of the Bell inventors was supported by "competent evidence" (App. 19a) the Court of Appeals correctly applied the following standard:

"Since the function of the corroborating evidence is to assist the fact finder in deciding whether the inventor's testimony is credible, the question whether its amount and quality is adequate for that purpose is peculiarly for the fact finder to pass upon in the light of the circumstances of the case. . . . Here the district court found that the testimony of the Bell inventors as to their work in reducing their invention to practice was sufficiently supported by corroborating evidence to be credited. We find no error in this regard." (App. 29a)

Consistent with the tactics used throughout its petition, Hughes completely ignores this clear statement of the standard applied by the Court below, asserting that the Court of Appeals (and the District Court) followed the rule that "oral testimony of inventors is sufficiently corroborated if supported by oral testimony of co-inventors and by *noncontemporaneous documents* prepared by the inventors themselves" (Pet. 20, emphasis by Hughes). That the Courts below applied no such rule is manifest from the scope of the evidence from many sources, both documents and testimony, which we have reviewed above (pp. 5-10 *supra*).

Hughes again has attempted to create the impression that a conflict exists between the rule of law applied by the Court below and by other Courts of Appeals. Hughes alleges that even apart from the opinions below a conflict exists between the Courts of Appeals with respect to corroboration. In citing a "*per se* rule"



and a "rule of reason" Hughes attempts to create confusion by the use of labels.\*

Above all, Hughes creates a conflict which is meaningless here. No matter which of Hughes' rules is applied to the facts of this case, the corroboration of the Bell Labs inventors' testimony, fully meets all requirements.

The District Court was well aware that "in making such account [of diligence], the testimony of the inventors alone is usually deemed insufficient" (App. 18a). Both the District Court and the Court of Appeals found there to be ample competent evidence to corroborate the inventor's testimony. Neither Hughes' "*per se*" cases nor its "rule of reason" cases help it here.\*\*

Hughes finally reaches its real point on the question of corroboration at pages 20-25 of its Petition. Unable to show any error in either the law or the findings below, Hughes raises for the first time in its Petition a new rule of law precluding use of "noncontemporaneous" documents. (Hughes ignores the corroborating testimony of the inventors' co-workers). We might almost call it a special rule of law—one written by Hughes to apply to Bell Labs in litigation against Hughes.\*\*\*

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\* The cases Hughes cites demonstrate that Hughes is confused by its own labels. For example, in Hughes' "*per se*" case, *Cleeton v. Hewlett-Packard Company*, 343 F.Supp. 1215 (D.Md. 1972), the Court cited, and applied, the standard of Hughes' leading "rule of reason" case, *Ritter v. Rohm & Haas Company*, 271 F.Supp. 313 (S.D.N.Y. 1967).

\*\* To the contrary, the facts of these cases demonstrate the soundness of the holdings below. For example in *Potter Instrument Co., Inc. v. Odec Computer Systems, Inc.*, 370 F. Supp. 198, 208 (D.R.I. 1974), labelled by Hughes as a *per se* case, testimony establishing diligence was corroborated through a written report and construction of models. The corroboration of the Bell Labs inventors' testimony certainly meets that standard. It far exceeds the corroboration found wanting in others of Hughes' *per se* cases. And even Hughes must concede that the facts here meet the requirements of its "rule of reason" cases.

\*\*\* We seriously doubt, if the existing documentation of Dill's work is any example (J.A. 12-14, Pretrial Order ¶¶C 14(a)-(i)) that Hughes, itself a "large patent-wise corporation", has any interest in seeing this special rule applied to itself.

Hughes makes much use in its Petition of the word "noncontemporaneous" to describe the Bell Labs documents and leaves the impression that the Bell Labs documentation was written long after the work was done.

But documents such as data sheets recording test data as it was taken are hardly "noncontemporaneous" documentation (PX 41, PX 46, PX 47). And only by the most blatant stretching can Hughes describe as "noncontemporaneous" the December 9, 1966 viewgraphs, which show in detail the work done on the January 5, 1966 memorandum describing that work (PX 42, PX 48). In the final analysis, the Bell Labs work even meets the requirements of Hughes' special rule.

Hughes professes concern that the decision below "invites both perjury and the destruction of adverse documents" (Pet. 22).\* Hughes would do better to concern itself with its attempts to create conflicts which do not exist and errors that were never made.

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\* Hughes, of course, notes that it does "not charge that fraud occurred in this case." (Pet. 23)



**Conclusion**

The Petition is without merit and should be denied.

Respectfully submitted,

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MAR 14 1978

MICHAEL RODAK, JR., CLERK

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IN THE  
**Supreme Court of the United States**  
OCTOBER TERM, 1977

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No. 77-1040

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HUGHES AIRCRAFT COMPANY,  
*Petitioner,*  
v.

BELL TELEPHONE LABORATORIES, INCORPORATED,  
*Respondent.*

---

**PETITIONER'S REPLY MEMORANDUM**

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IN THE  
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No. 77-1040

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HUGHES AIRCRAFT COMPANY,  
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BELL TELEPHONE LABORATORIES, INCORPORATED,  
*Respondent.*

---

**PETITIONER'S REPLY MEMORANDUM**

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Respondent's Brief in Opposition ("Resp. Brief") relies exclusively on repeated assertions that there are no valid issues of law or conflicts in the Circuits presented by this case. However, a newly published Court of Customs and Patent Appeals decision—which will be before this Court shortly on petition for a writ of certiorari—refutes Respondent's assertions. *See Naber v. Cricchi*, 567 F.2d 382 (C.C.P.A., Dec. 22, 1977), *petition for rehearing denied* (C.C.P.A., Feb. 23, 1978), *mandate stayed pending petition for writ of certiorari* (C.C.P.A., March 2, 1978) (copy attached hereto as Appendix A). Since the *Naber* decision is directly contrary to the Third Circuit's decision in the instant case, and since the two cases may be before this Court simultaneously,<sup>1</sup> Petitioner contends that a comparison of the two will demonstrate the important and recurring conflict in the lower courts on the first question presented by Hughes' Petition.

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<sup>1</sup> The Court of Customs and Patent Appeals has stayed its mandate until April 1, 1978, in order for Appellee in *Naber* to file its Petition in this Court. Counsel for Appellee in *Naber* has informed the undersigned that he will be filing such a Petition.

Like the instant case, the *Naber* litigation is a patent interference proceeding<sup>2</sup> requiring judicial interpretation of the "reasonable diligence" standard in 35 U.S.C. § 102 (g). The Appellee ("Cricchi") in *Naber*, like Bell here, had been the first to conceive a new invention and, again like Bell, had delayed reducing his invention to practice until after Appellants ("Naber") had done so. The Board of Patent Interferences in *Naber*, like the District Court in the Hughes-Bell dispute, found that Cricchi's delay during a key four-month period was due to his work on certain "layer deposition techniques." Because this work was directed toward making the invention a "useful device," rather than a "mere laboratory device," the trial board concluded that "this work was required in order to reduce to practice" the invention and thus constituted "reasonable diligence" under 35 U.S.C. § 102(g). App. at 9a.<sup>3</sup>

In contrast to the Third Circuit in the instant case, however, the Court of Customs and Patent Appeals in *Naber* reversed as a matter of law, holding that the trial board had applied the wrong legal standard in making its findings. *Id.* at 9a-10a.<sup>4</sup> The appellate court in *Naber* relied upon the rule that "there need not be commercial utility to have a reduction to practice." *Id.* at 9a. The court concluded that the "public policy favoring the early disclosure of inventions" requires courts to exclude from the efforts considered as "reasonable dili-

<sup>2</sup> The interference proceeding in *Naber*, as here, involves semiconductor devices used for integrated circuits.

<sup>3</sup> The Appendix to this Reply Memorandum will be cited as "App. —." The Appendix to Hughes' Petition for a Writ of Certiorari will be cited as "Pet. App. —."

<sup>4</sup> In addition to its holding on the reasonable diligence issue, the *Naber* court also considered the issue raised in the instant case relating to the type of evidence needed to corroborate an inventor's oral testimony. On this point, too, the Court of Customs and Patent Appeals took a different approach than the Third Circuit and ruled that time records prepared by the inventor himself were not sufficient corroboration of the inventor's oral testimony. App. at 10a-11a.

gence" any work which is "needed to produce a commercially acceptable device," but which is not necessary for reduction to practice. *Id.*

Although the board found that "this work was required in order to reduce to practice" the invention of the counts, both Cricchi and his supervisor admitted that a simple transistor embodying the structure embraced by the counts could have been built and tested for its memory characteristics. Cricchi chose not to proceed to a reduction to practice with a simple transistor, but to wait until work on layer deposition techniques progressed. Since he admittedly "possessed the capability of conducting such a test," it was his burden to reconcile the waiting period with the "reasonable diligence" requirement. \* \* \*

The board found, and Cricchi contends, that the work on layer deposition techniques was required to produce a "useful device," rather than a "mere laboratory device." However, there need not be commercial utility to have a reduction to practice. \* \* \* Acceptance of the proposition that the "reasonable diligence" requirement was satisfied, notwithstanding delay due to general work (on layer deposition techniques needed to produce a commercially-acceptable device), would, in effect, grant Cricchi a reservoir of "reasonable diligence" arising from work commenced prior to conception on October 22, 1969, and continuing into 1975. We are not persuaded that this accords with public policy favoring the early disclosure of inventions. [*Id.* at 8a-9a (footnotes and citations omitted).]

In the instant case, as in *Naber*, the District Court concluded that solution of the hysteresis problem, to which Bell's inventor "directed his efforts" in the Fall of 1966 (Pet. App. 11a), would contribute to the commercial usefulness of the invention, but was not necessary for "a successful reduction to practice." Pet. App. 16a. Nevertheless, directly contrary to the holding of the Court of



Customs and Patent Appeals in *Naber*, the lower courts here held that work on such matters *can* constitute reasonable diligence under 35 U.S.C. § 102(g). Pet. App. 19a n.19.

Bell has contended that the lower courts' "reasonable diligence" rulings are determinations of fact only, that they raise no legal issues, and that they therefore do not present any lower court conflict worthy of review by this Court. See Resp. Brief at 11-13. These contentions beg the question raised by Hughes. The District Court found *as a matter of fact* that the hysteresis problem "would not have precluded a successful reduction to practice." Pet. App. 16a. Nevertheless, over Hughes' repeated objections, the District Court then concluded *as a matter of law* that work directed toward such "problems inhibiting commercial utilization of the process should be deemed reasonable diligence." *Id.* at 19a n.19. The Third Circuit affirmed that holding, thus departing from the legal rule stated in *Naber*—as well as in the cases cited at pages 10-13 of Hughes' Petition—that proof of work aimed solely at enhancing the commercial utility of an invention, but not necessary to its reduction to practice, must be excluded *as a matter of law* from "reasonable diligence" consideration.

The District Court and Third Circuit rulings cannot be disposed of by labeling them mere "findings of fact." Hughes does not challenge any factual findings. The question presented here is the legal standard by which such factual findings, once made, are to be judged: may work affecting commercial utility, but unrelated to reduction to practice, be credited toward "reasonable diligence," or may it not? As we have shown, the Third Circuit has answered that legal question differently than *Naber* and other lower court decisions on the issue.

Moreover, it should be noted that the Court of Customs and Patent Appeals reached its final ruling in *Naber* only *after* Appellee had urged the court to follow the Third

Circuit's contrary holding in the instant case. See Petition for Rehearing at 8, *Naber v. Cricchi*, *supra*:

In *Bell Telephone Labs. v. Hughes Aircraft Co.*, 191 USPQ 23, 27, 30 (D. Del. 1976) diligence was found even though the inventor spent much time on a metallization step which was not included in the counts and elected to substitute an experimental metallizing step for a conventional step in the production of silicon-gate field effect transistors. The court specifically pointed out that (p. 31) "work on problems inhibiting commercial utilization of the process should be deemed reasonable diligence \* \* \*."

Thus, despite Bell's repeated suggestions to this Court that no conflict or issue of law is presented by the instant case (*e.g.*, Resp. Brief at 2, 3, 13), and despite Bell's lengthy but irrelevant recitation of evidence intended to convince the Court that this case simply raises factual issues (*id.* at 4-10), the *Naber* decision provides timely confirmation of the conflict between the Circuits on an important and frequently recurring legal issue that requires review by this Court.

Hughes believes that it already has anticipated and responded to the remaining arguments raised by Respondent, and wishes to add only the following brief points:

1. *There is a conflict between the Circuits on the standard for corroborative evidence.* Bell has argued that the cases cited at pages 17-19 of Hughes' Petition do not reveal any conflict between the Circuits on the standard for corroborative evidence, and that Hughes has sought "to create confusion by the use of labels." Resp. Brief at 14. Bell seeks to support this charge by referring to *Cleeton v. Hewlett-Packard Co.*, 343 F. Supp. 1215 (D. Md. 1972), one of the cases Hughes cited as illustrative of the "*per se*" rule. Bell claims that *Cleeton* actually "cited, and applied, the standard of Hughes' leading 'rule of reason' case, *Ritter v. Rohm & Haas*



*Company*, 271 F. Supp. 313 (S.D.N.Y. 1967).” Resp. Brief at 14 n.\*. Bell’s reference to the *Cleeton* decision is inaccurate and misleading. As Hughes showed in its Petition, the *Cleeton* court stated (with citations) that it follows the rule that an inventor’s *own writings* cannot constitute the “necessary independent corroboration” required to support his oral testimony. *Cleeton v. Hewlett-Packard Co.*, *supra*, 343 F. Supp. at 1221. The *Cleeton* court went on, however, to note that “in other cases” courts have held that a “rule of reason” should determine whether an inventor’s own writings are sufficient to corroborate his oral testimony. *Id.* It was *in that context* that the *Cleeton* decision, as Bell notes, cited *Ritter v. Rohm & Haas Co.* as an example of the differing “rule of reason” approach.<sup>5</sup> Thus, contrary to Bell’s suggestion, the *Cleeton* decision clearly supports Hughes’ point that there is a conflict between the Circuits on this issue.

2. *There was no contemporaneous documentation of Bell’s inventors’ work.* Bell accuses Hughes of being “flatly wrong” in arguing that the lower courts allow Bell to corroborate its inventors’ oral testimony with “*non-contemporaneous documents* prepared by the inventors themselves.” Resp. Brief at 9 (emphasis in original). Bell then cites a string of evidence which it contends proves Hughes wrong. *Id.* That evidence, however, is irrelevant to Hughes’ contention (see Petition at 19-20 & n.16), since, as Bell itself notes, the cited documents were written in November, December or January—not contemporaneously with the work done from October 17, 1966 to mid-November 1966, the key period for which the District Court noted there was an absence of contemporaneous documentation. Pet. App. 12a, 19a.

3. *Bell did destroy key documents.* In urging a new, stronger corroborative evidence rule, Hughes’ Petition

<sup>5</sup> The *Cleeton* court concluded that even “assuming, *arguendo* only,” it were to follow the *Ritter* rule, the result would be the same, given the facts of that case. 343 F. Supp. at 1222.

noted that prior to this litigation Bell had destroyed certain important documents relating to the “reasonable diligence” period. Petition at 22 & n.19. While Bell responds that nothing of substance was ever destroyed (Resp. Brief at 10), it simply ignores the fact that at trial its own counsel acknowledged—with “regret”—that “raw data” that presumably was recorded in dated laboratory notebooks had been destroyed prior to the start of this litigation. J.A. 242. Furthermore, that destruction occurred notwithstanding Bell’s own internal policies requiring retention of laboratory notebooks for 30 years. Defendant’s Exhibit 12. It is undisputed that Bell never offered any explanation of how or why it destroyed this key data.

\* \* \*

For all of the reasons set forth above, as well as those urged in its earlier Petition for a Writ of Certiorari, Petitioner respectfully urges this Court to grant certiorari in order to resolve the conflict in the lower courts concerning important principles of patent law.

Respectfully submitted,

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APPENDIX

UNITED STATES COURT OF CUSTOMS  
AND PATENT APPEALS

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Appeal No. 77-556

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CHARLES T. NABER and GEORGE C. LOCKWOOD,  
*Appellants,*

v.

JAMES R. CRICCHI,  
*Appellee.*

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Dec. 22, 1977

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In patent interference proceeding, appeal was taken from decision of the Board of Patent Interferences, Interference No. 98,566, awarding priority of invention to the junior party. The Court of Customs and Patent Appeals, Miller, J., held that: (1) with respect to an improved "drain-source-protected" metal-nitride-oxide-semiconductor device which could be used as a nonvolatile, electrically alterable memory element in various integrated circuits, work during particular period directed at improving oxide and nitride layer deposition techniques generally applicable to all metal-nitride-oxide-semiconductor devices and not merely the "drain-source-protected" device of the counts at issue did not satisfy the requirement of "reasonable diligence" on the part of the junior party with respect to reducing invention to practice, and (2) with respect to work after the forgoing period, junior party's uncorroborated testimony together

with time cards which were not self-explanatory could not satisfy the burden of showing "reasonable diligence."

Reversed.

1. Patents § 90(5)

In order to satisfy "reasonable diligence" requirement, work relied on must ordinarily be directly related to reduction to practice of the invention of the counts in issue; however, work in preparation for filing related patent applications may suffice, as may work required to develop a first invention in order to develop or reduce to practice a second invention. 35 U.S.C.A. § 102(g).

See publication Words and Phrases for other judicial constructions and definitions.

2. Patents § 90(5)

There need not be commercial utility to have a reduction to practice.

3. Patents § 90(5)

With respect to an improved "drain-source-protected" metal-nitride-oxide-semiconductor device which could be used as a nonvolatile, electrically alterable memory element in various integrated circuits, work during particular period directed at improving oxide and nitride layer deposition techniques generally applicable to all metal-nitride-oxide-semiconductor devices and not merely the "drain-source-protected" device of the counts at issue did not satisfy the requirement of "reasonable diligence" on the part of the junior party with respect to reducing invention to practice. 35 U.S.C.A. § 102(g).

4. Patents § 113(1)

Where issue was not raised in senior party's main brief before the Board of Patent Interferences but was raised in request for reconsideration and the Board considered

the argument in reaching its decision, issue was properly before court on appeal.

5. Patents § 91(4)

Junior party's uncorroborated testimony together with time cards which were not self-explanatory could not satisfy junior party's burden of showing "reasonable diligence" in reducing invention to practice, where junior party did not present any documentary evidence showing specific acts at specific times directed at a reduction to practice of the invention of the counts at issue and testimony of his own witnesses contradicted his allegation that time charged to the project numbers on the time cards was directed solely at a reduction to practice of such invention.

6. Patents § 113(6)

Where junior party argued issue of senior party's entry into the field before the Board of Patent Interferences, it was not necessary for him to file a cross appeal to preserve the issue for argument before court on senior party's appeal from award of priority to the junior party.

7. Patents § 113(1)

Where senior party did not question finding of date of its entry into the field, so that it would have been junior party who would have raised the issue if it were to be argued before the court on senior party's appeal from award of priority of invention to junior party, costs of printing, at request of junior party, portions of transcript relating to such issue would be assessed against junior party.

---

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Before MARKEY, Chief Judge, and RICH, BALDWIN, LANE and MILLER, Judges.

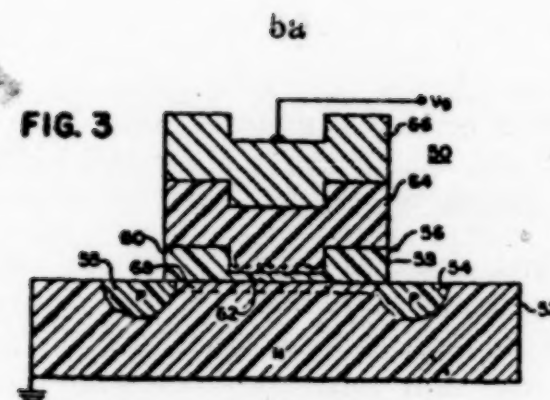
MILLER, Judge.

This appeal is from the decision of the Patent and Trademark Office Board of Patent Interferences (board) awarding priority of invention of the counts in issue to the junior party, Cricchi. The counts were copied by Cricchi<sup>1</sup> from a patent to Naber et al. (Naber) No. 3,719,866, issued March 6, 1973, and entitled "Semiconductor Memory Device." The dispositive question, which the board decided in favor of Cricchi, is whether Cricchi was reasonably diligent from a time just prior to Naber's entry into the field (June 1970) until Cricchi's actual reduction to practice (September 1971). We reverse.

#### *Subject Matter of the Counts*

The invention is an improved "drain-source-protected" metal-nitride-oxide-semiconductor (MNOS) device which can be used as a nonvolatile, electrically alterable memory element in various integrated circuits. The specific improvement (illustrated by Figure 3 of the Naber patent) is that the silicon oxide layer (56) in the vicinity of the drain (54) and source (55) of the transistor is made thicker (shown at areas 58 and 60) than the corresponding layer in prior art devices.

<sup>1</sup> In an amendment filed June 1, 1973, to his application serial No. 219,463, filed January 20, 1972, entitled "Enhancement Mode Limited MNOS Memory Device."



All of the counts include a recitation of this structure. Count 1 is illustrative and reads as follows:

#### Count 1

A metal-nitride-oxide-semiconductor device comprising:

a semiconductor material substrate of one conductivity having a first and a second region of opposite conductivity extending therein, said first and second regions being separated by a channel region having a channel formed therein through which majority carriers can flow from said first region to said second region, said first, second, and channel regions all extending from one surface of said substrate;

a layer of oxide material affixed to said one surface of said substrate to interface with the junction of said first region-channel region, said channel region, and the junction of said channel region-second region, said oxide layer having a first thickness in the vicinity of said first region-channel region junction and in the vicinity of said channel region-second region junction and a second thickness there between;

a layer of nitride material affixed to said oxide material and spaced apart from said substrate by said oxide material; and

a layer of conductor material affixed to said nitride material and spaced apart from said oxide material by said nitride material;

said first thickness being of more than a charge tunnel thickness to prevent any charge from tunneling between said oxide material-nitride material interface and said substrate-oxide material interface and said second thickness being of less than a charge tunnel thickness to allow charge to tunnel between said oxide material-nitride material interface and said substrate-oxide material interface.

#### *Proceedings Below*

The Board found that Cricchi established conception of the subject matter of the counts on October 22, 1969, and concluded that the combined testimony of Cricchi's co-workers established—

that at the time Cricchi conceived of the device . . . improvements were necessary in deposition processes of the oxide and nitride layers and that efforts to improve on the processes were part of a continuous program which extended from prior to October of 1969 into October of 1970.<sup>2</sup>

The board also found that Cricchi Exhibit 100, consisting of copies of time cards for four project numbers, "indicates reasonably continuous activity charged to the project numbers . . . used to identify the programs for constructing and testing the MNOS transistor" embodying the counts in issue. The board was not persuaded by Naber's argument that experiments directed at improving layer deposition techniques generally did not satisfy the "reasonable diligence" requirement, not being directed at

<sup>2</sup> The program of improving deposition techniques was still going on in 1975 at Westinghouse, Cricchi's assignee.

construction and testing of the MNOS device of the counts. It said:

[T]his work was required in order to reduce to practice the transistor conceived by Cricchi on October 22, 1969. Dr. Corak [Cricchi's supervisor] testified that improvement in the method of deposition was required in order to produce a useful device rather than a mere laboratory device.

In the Request for Reconsideration, Naber argued that Cricchi was not reasonably diligent during the period from June to October 1970 since work done then was directed at improving layer deposition techniques generally; further, that Cricchi Exhibit 100 was not proof of diligence during the period from October 1970 to September 1971. The board adhered to its original decision.

#### OPINION

##### *1. Work on Layer Deposition Techniques (June to October 1970)*

[1] The record shows that the work done at Westinghouse to improve oxide and nitride layer deposition techniques was generally applicable to all MNOS devices, not merely the "drain-source protected" device of the counts, and that this work had in fact commenced *prior* to Cricchi's conception of the invention. It is well settled that, to satisfy the "reasonable diligence" requirement of 35 U.S.C. § 102(g), the work relied on must ordinarily be directly related to reduction to practice of the invention of the counts in issue. *Anderson v. Scinta*, 372 F.2d 523, 54 CCPA 1269, 152 USPQ 584 (1967); *Martin v. Snyder*, 214 F.2d 177, 41 CCPA 1010, 102 USPQ 306 (1954); *Gunn v. Bosch*, 181 USPQ 757 (Bd.Pat.Int'f 1973); *Moore v. Harris v. Hale*, 92 USPQ 187 (Bd.Pat.Int'f 1951). However, work in preparation for filing related patent applications may suffice (*e. g.*, *Rey-Bellet*



v. *Englehardt*, 493 F.2d 1380, 181 USPQ 453 (Cust. & Pat. App. 1974)), as may work required to develop a first invention in order to develop or reduce to practice a second invention (e. g., *Keizer v. Bradley*, 270 F.2d 396, 47 CCPA 709, 123 USPQ 215 (1959); *Thompson v. Dunn*, 166 F.2d 443, 35 CCPA 957, 77 USPQ 49 (1948)).

There is no evidence that Cricchi's layer deposition techniques work was in preparation for filing related patent applications or was required to develop a first invention needed to proceed with the invention of the counts. Although the board found that "this work was required in order to reduce to practice" the invention of the counts, both Cricchi and his supervisor admitted that a simple transistor embodying the structure embraced by the counts could have been built and tested for its memory characteristics.<sup>3</sup> Cricchi chose not to proceed to a reduction to practice with a simple transistor, but to wait until work on layer deposition techniques progressed.<sup>4</sup> Since he admittedly "possessed the capability of conducting such a test," it was his burden to reconcile the waiting period with the "reasonable diligence" requirement. *Litchfield v. Eigen*, 535 F.2d 72, 76, 190 USPQ 113, 116 (Cust. & Pat. App. 1976).<sup>5</sup>

<sup>3</sup> Naber does not contend, nor would we agree, that Cricchi was under an absolute obligation to choose the simplest device embodying the structure of the counts to attempt a reduction to practice.

<sup>4</sup> Cricchi's brief contains the statement: "The fact that the demonstration device might have been constructed without doing this work [the process development work relating to layer deposition techniques] has been clearly recognized by Cricchi during all phases of this case."

<sup>5</sup> Public policy favors the early disclosure of inventions. This underlies the requirement for "reasonable diligence" in reducing an invention to practice, not unlike the requirement that, to avoid a holding of suppression or concealment, there be no unreasonable delay in filing an application once there has been a reduction to practice. See *Young v. Dworkin*, 489 F.2d 1277, 180 USPQ 388 (Cust. & Pat.App. 1974).

[2] The board found, and Cricchi contends, that the work on layer deposition techniques was required to produce a "useful device," rather than a "mere laboratory device." However, there need not be commercial utility to have a reduction to practice. As this court said in *Goodrich v. Harmsen*, 442 F.2d 377, 383, 58 CCPA 1144, 1153, 169 USPQ 553, 559 (1971): "In the nature of things, testing goes on throughout the process of 'commercializing' and often continues after a product is on the market where it usually receives its severest test." Acceptance of the proposition that the "reasonable diligence" requirement was satisfied, notwithstanding delay due to general work (on layer deposition techniques needed to produce a commercially-acceptable device), would, in effect, grant Cricchi a reservoir of "reasonable diligence" arising from work commenced prior to conception on October 22, 1969, and continuing into 1975. We are not persuaded that this accords with public policy favoring the early disclosure of inventions.

[3] Cricchi's reliance on *Justus v. Appenzeller*, 177 USPQ 332 (Bd.Pat.Int'f 1971), is misplaced. In that case, a reduction to practice of the counts required a "bearing means" which Justus ordered to be custom made. Unforeseen circumstances delayed delivery of the bearings, with resultant delay in Justus' reduction to practice. Such circumstances are not present here. Cricchi had the materials and capability in June 1970 to produce a working MNOS memory device of the counts.<sup>6</sup>

We hold that work done at Westinghouse during the period from June to October 1970 directed at improving oxide and nitride layer deposition techniques generally

<sup>6</sup> On the record before us, the correctness of the board's conclusion, that such a device would have operated for only a "few hours" before failure, is questionable. In a proposal to the Air Force, Westinghouse indicated that it had developed an MNOS device early in 1969 that was operable for "greater than 1,000 hours."



applicable to all MNOS devices did not satisfy the requirement of "reasonable diligence" on the part of Cricchi.

## 2. Time Card Charges (October 1970 to September 1971)

[4] Naber argues that Cricchi's testimony concerning the work performed under the four project numbers covered by time card charges of record is uncorroborated and, thus, cannot be used to show diligence; also, that work done under the project numbers after October 1970 was not directed at reducing to practice the invention of the counts.<sup>7</sup>

We are satisfied that at least some work done after October 1970 and charged to the project numbers had nothing to do with reducing to practice the invention of the counts. Thus, one Westinghouse employee (a Cricchi witness) testified that he did not begin working on the "834 device" (a device embodying the count limitations) until May 1971; but his time card charges show work done under the project numbers before that date.<sup>8</sup> This flatly contradicts testimony in the Cricchi record that if time was charged to the project numbers, the work being done was on the "834" project.

[5] Naber's argument that Cricchi's uncorroborated testimony cannot satisfy the burden of showing "reasonable diligence" is well taken. *Kendall v. Searles*, 173 F.2d 986, 36 CCPA 1045, 81 USPQ 363 (1949). Cricchi did not present any documentary evidence showing specific acts at specific times directed at a reduction to practice of the invention of the counts. Instead, he relies on time cards showing work charged to four project numbers

<sup>7</sup> Although appellants did not raise this issue in their main brief before the board, they did so in their Request for Reconsideration, and the board considered the argument in reaching its decision. Thus, the issue is properly before the court. Cricchi is incorrect in labeling the argument an improper new issue.

<sup>8</sup> Indeed, Cricchi admits this in his brief.

for this purpose. However, the time cards are not self-explanatory, and Cricchi's is the only testimony that undertakes to explain the work performed. Nothing in the record corroborates Cricchi's explanation. As pointed out above, testimony of one of Cricchi's own witnesses contradicts his allegation that time charged to the project numbers was directed solely at a reduction to practice of the invention of the counts.

Accordingly, we hold that the time card charges of record and Cricchi's uncorroborated testimony concerning the work covered thereby do not satisfy Cricchi's burden of proving "reasonable diligence" during the period from October 1970 to September 1971.

## 3. Motion to Tax Costs

Naber has moved to assess printing costs against Cricchi for the portions of the transcript requested by Cricchi. These cover all of the testimony of Naber's witnesses. Cricchi states that his reason for including such testimony in the transcript was that Naber's Notice and Reasons of Appeal indicated that Naber would argue Cricchi's date of conception; that "[i]f Cricchi's date of conception was to be argued, this automatically raises the question of when did Naber et al. enter into the field."

[6, 7] Because Cricchi argued the issue of Naber's entry into the field before the board, it was not necessary for him to file a cross-appeal to preserve the issue for argument before this court. *Clauss v. Foulke*, 379 F.2d 586, 54 CCPA 1514, 154 USPQ 85 (1967). However, if that issue were to be argued before this court, it would have been Cricchi who would have raised the issue, Naber not having questioned the board's finding of Naber's date of entry into the field. Since the costs of printing the material necessary for the court to make a determination of the issues raised by appellee are normally as-

essed against appellee, *Meitzner v. Mindick*, 549 F.2d 775, 193 USPQ 17 (Cust. & Pat. App.), *cert. denied*, — U.S. —, 98 S.Ct. 174, 54 L.Ed.2d 124 (1977), Naber's Motion to Tax Costs to appellee Cricchi is granted.

The decision of the board awarding priority to Cricchi on counts 1-4 is *reversed*.

***REVERSED.***